

HUMAN SKELETAL REMAINS FROM HARAPPA

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(WITH SEVENTYTWO PLATES AND ONE HUNDRED ELEVEN FIGURES)

FOREWORD

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THE ARCHAEOLOGICAL BACKGROUND

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DEMOGRAPHIC NOTES ON HARAPPA SKELETONS

J. M. DATTA

HUMAN REMAINS FROM HARAPPA

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The Anthropological Survey of India has great pleasure in submitting the first report on the Harappān skeletal remains.

The Archaeological Survey of India began excavation in Harappā in 1921 and carried it on till after 1946. Dr B. S. Guha, who was originally attached to the Zoological Survey of India as Anthropologist, was entrusted with the task of reporting on the skeletal remains. He was responsible for the work till his retirement from the Anthropological Survey in 1954.

During his tenure of office as Director, Dr Guha succeeded in training up a fairly large number of very able assistants through whom the major portion of the work was actually conducted. Mr H. K. Bose who was originally employed by the Archaeological Survey was, in the main, responsible for the lifting up of the skeletons from 1930 to 1947. Later on, as a member of the staff of the Anthropological Survey of India, he was also responsible for reconstruction. The main work of reconstruction, however, was entrusted by Dr Guha to Mr M. Biswas, Senior Technical Assistant in the Survey. Mr Biswas is a skilled craftsman and had the advantage of training under Dr B. S. Guha, Dr A. K. Mitra, Dr B. K. Chatterjee, and Mr H. K. Bose. In the work of cleaning, preservation and partly of reconstruction others who helped were Messrs P. Gupta, B. N. Chatterji, J. N. Biswas, and H. N. Das.

FOREWORD

There is a story behind the delay after which it has been possible to present the scholarly world with at least the first report on Harappān remains.

The Harappān remains were removed to Banaras on account of the war. Unfortunately, during the heavy floods of 1943, several boxes containing the precious material were slightly damaged. It was only in 1948 that the remains were once more removed to Calcutta. By that time the Anthropological Survey of India had come into being as an independent department. Since 1948 the work has gone on steadily in the Osteology Laboratory of the Anthropological Survey in Calcutta.

In the Census Report of 1931, Vol. I, Part III, Dr B. S. Guha described briefly the important features of the Harappān skeletons which had been recovered up to that time. It is obvious from a foot-note at page lxviii of the same report that a description of the Harappān human remains

had already been sent to the press. But nothing is known of what happened about its printing. No copy was also available in the office of the Survey. Some notes prepared by Dr Guha were, however, incorporated in *Excavation at Harappa*, Vol. I, by M. S. Vats. Sir Mortimer Wheeler's paper entitled 'Harappa 1946 : The Defences and Cemetery R 37', published in *Ancient India*, No. 3, 1947, contains descriptive notes on the graves of Cemetery R 37 and Cemetery H st I, both exposed in 1946.

It appears from our office records, that some dioptrographic drawings were prepared at Banaras ; but these are not traceable. Later on, Dr B. K. Chatterjee and Mr G. D. Kumar also prepared the draft of a report on Harappān skeletons, which, could not however be utilized, for several reasons, during the preparation of the present report.

All measurements and drawings presented here are the result of the labours of Messrs P. Gupta, P. C. Dutta, A. Basu, A. Pal, Miss B. Sinha and Mrs A. Ray. This group worked on the skeletal material reconstructed by their predecessors from the 1st of August 1961 to the end of December 1961. The report was prepared by Messrs P. Gupta, P. C. Dutta and A. Basu between January 1962 and July 1962.

It may be pointed out here that the report on such a precious collection as Harappā ought to contain basic data as well as a comparison with skeletal material recovered from other contemporary sites. A comparison is also possible with the physical characteristics of different populations inhabiting India and the neighbouring countries at the present time. However valuable the latter part of the work may be, it was considered advisable to publish the basic data first of all for the use of the scholarly world. The work of comparison or inference drawn from them can be undertaken at any time later on by scholars either in India or abroad.

It has been with this end in view that the basic data are now being published. It will also be noted from the report that the scholars responsible for it have been very guarded in the nomenclature of various physical types described. Under advice, the types have been designated as A and B, split up into several sub-types. It was decided that it would be better not to give names to types as has already been done by previous authors ; for that might suggest inferences which may not even-

tually be borne out by later discoveries or comparisons. But the present writers have been careful in indicating what names have been given to their types or sub-types by other scholars ; so that the reader may easily equate one with the other.

As organizational head of the Anthropological Survey of India, I beg to place on record my appreciation of the enthusiasm and expeditiousness with which young scholars have prepared the report ; and the skill and accuracy of craftsmanship with which Mr M. Biswas and others have actually succeeded in reconstructing the skeletal remains. My thanks are also due to a great measure to Stenographer Mr B. N. De, Photographer Mr S. Chattopadhyay, Artists Messrs R. C. Dey and B. N. Bagchi and Statisticians Messrs H. K. Nag, D. P. Mukherjee, M. N. Kaul and S. Chatterjee. Mr H. N. Mukherjee has been of assistance in proof-correction and preparation of the copy. Mr Arun Chakrabarti has been very largely responsible for efficient printing of the report. Messrs Venus Printing Works, Calcutta, to whom the task was entrusted, have shown admirable patience and courtesy ; and it has also been on account of their appreciation of the importance of the work that it has been possible for the report to be printed within a reasonably short period of time.

Last, but not least, my thanks are due to my friend Mr J. M. Datta, formerly a Fellow of the Royal Statistical Society and of the Royal Economic Society, who has contributed a brief, but significant chapter on the population of Harappa. The data placed at his disposal have not naturally been sufficient ; yet, he has thrown out a few suggestions with regard to the population which are certainly thought-provoking.

*Anthropological Survey of India,
Calcutta.*

Dated the 15th of August, 1962.

NIRMAL KUMAR BOSE

Director

The Archaeological Background

A. GHOSH,

Director General of Archaeology in India

INTRODUCTION

How the excavations at Harappa in Montgomery District and at Mohenjo-daro in Larkana District, both now in West Pakistan, carried out by the Archaeological Survey of India, mostly in the twenties of the present century, revolutionized the concept of the origins of civilization in the Indo-Pakistan sub-continent is well-known and need not be dwelt upon here. It would suffice to say that later explorations have shown that the culture revealed at these two sites, initially named after the Indus but now more commonly called the Harappa culture, extended, variously in its pure state or in its ramifications, from Baluchistan on the west to beyond Delhi on the east, and from the foot-hills of the Himalayas in the north to the Tapti estuary in the south. Spatially, therefore, it was the most extensive of the Bronze-Age¹ cultures of south-western and southern Asia. On the temporal side, the latest view is that for Panjab and Sind 'a provisional dating of 2500-1500 B.C....responds consistently to current tests'².

To come directly to the subject-matter of the present memoir. The human skeletal remains found at Mohenjo-daro have been reported on and conclusions drawn therefrom³. In the excavations

¹ The Harappa culture has often been called 'chalcolithic' on account of the use of tools and other objects of stone along with those of copper by the people in their daily life.

² Mortimer Wheeler, *The Indus Civilization*, 2nd ed. (Cambridge, 1960), p. 99. It may be recorded here that the very recent (1962) Carbon-14 dating of objects from the late Harappan levels of Kalibangan, District Ganganagar (north Rajasthan), and of Lothal, District Ahmadabad (Gujarat), is, in both cases, 4080 ± 125 Before Present. Even making allowance for all limitations of this method of dating, one might wonder if 1500 B.C. for the

end of the Harappa culture does not err too much on the conservative side, though it may be argued that the suggestion holds good only for Panjab and Sind and has the advantage of establishing a possible causal connexion between the advent of the Aryans and the disappearance of the Harappans. Cf. Wheeler (1960), pp. 96-99. Our view is that nothing that has been said and excavated till now has established any connexion between the Harappans and the Aryans at any stage.

³ John Marshall, *Mohenjo-daro and the Indus Civilization* (London, 1931), I, pp. 107-08; R. B. Seymour Sewell and B. S. Guha in *ibid.*, II, pp. 599-648.

at Harappa⁴ as well, human remains were encountered in various contexts, with which it is necessary for the reader of the present memoir to be acquainted and which are given below, to explain the circumstances of their discovery and the burial-customs they reveal.

AREA (MOUND) G⁵

In the southern portion of Trench II in this Area, there was a group of human skeletal remains, which were found tightly packed together between 4 ft. and 5 ft. 10 in. below surface and consisted of twenty complete human skulls and fragments of a few others, ten lower jaws, parts of vertebral columns and bones of hips, legs and arms, besides some animal-bones and a considerable quantity of pottery. Except in one case, in which the skull lay alongside the trunk, all bones were disarticulated and lay in a disorderly condition⁶. While regular burials are thus ruled out, at best fractional post-exposure deposits, possibly within undetected pits, are uncertainly indicated. The evidence is too ill-defined to be of help in determining the burial-custom(s) of the Harappans.

The pottery found with the bones cannot be regarded as real grave-furniture in that fragments of pots lay without any regular order. However, the pottery was typically Harappan but included two dishes-on-stand supposed to be of an aberrant type⁷.

AREA (MOUND) AB

Human remains, consisting of two fragmentary human skulls, a lower jaw and some other bones, a tubular terracotta bead and a fragment of the base of a dish-on-stand were found 'between the IIIrd and IVth strata'⁸ in this Area. Here also, while a post-exposure fractional burial seems to be indicated, the details are not clear.

SQUARE (CEMETERY) R 37

In 1938 and 1939, twentyseven regularly-disposed skeletons were excavated in Square R 37 with typical Harappan pottery as grave-furniture⁹. A few more skeletons were excavated in the next two or three years¹⁰. As there could be no mistake that they lay in a regular cemetery, systematic

⁴ The excavations were carried out by Daya Ram Sahni from 1921 to 1924-25, by Madho Sarup Vats from 1926-27 to 1933-34 and by R.E.M. Wheeler in 1946. See also n. 10. Sahni's report appears in *Annual Report, Archaeological Survey of India, 1920-21* (1923), pp. 15-17, *1923-24* (1926), pp. 52-54, and *1924-25* (1927), pp. 73-80, Vats' in his *Excavations at Harappa*, 2 vols. (Delhi, 1940), and Wheeler's in *Harappa 1946: the Defences and Cemetery R 37*, *Ancient India*, no. 3 (1947), pp. 58-130.

⁵ It may be necessary to explain here such site-labels as G, AB, R 37, etc. Alexander Cunningham, who visited Harappa in 1872-73, numbered the mounds as A to E, *Archaeological Survey of India Reports*, V (Calcutta, 1875), pl. XXXII. Later on, it must have been noticed that his A and B together represented a single mound: that mound was, therefore, called AB. At the

same time, Cunningham's letters were extended by F to J to cover unnumbered mounds, Vats, II, pl. I. Simultaneously, the whole site of Harappa was gridded into 100-ft. squares for purposes of co-ordination, 'those running west to east being numbered A, B, C, etc., and similarly those going from north to south, 1, 2, 3, and so on', *ibid.*, I, p. 8. This would explain 'R 37'.

⁶ Vats, I, pp. 198-202.

⁷ *Ibid.*, I, p. 233; II, pl. LXX, 10 and 14.

⁸ *Ibid.*, I, pp. 161-62,

⁹ *Ibid.*, I, p. 200 n.

¹⁰ The excavations of 1938-41 were carried by K. N. Sastri, Custodian, Archaeological Museum, Harappa, and H. K. Bose of the Anthropological Survey of India.

excavation was undertaken in 1946 with a view to exposing a few more burials under closely-observed conditions and to linking stratigraphically Cemetery R 37 with the previously-discovered Cemetery H¹¹. As a result of the excavation, ten additional graves were identified ; it was also established that 'the cemetery belongs to one and the same general stratum and was in continuous use.

'The body was normally extended, occasionally on one side or the other, with the head to the north (between north-west and north-east, but usually within a few degrees of north)... Grave-pits varied in dimensions, ranging from 10 to 15 feet in length, 2½ to 10 feet in width, and dug to a depth of 2 to 3 feet from the contemporary surface. An average grave measured superficially 10 by 3-4 feet, with a depth of 2 feet. The pit was generally wider towards the head. Its large size was due to the custom of including large quantities of pottery, mostly near the head but some also at the feet and along the sides and occasionally below the body. The number of pots accompanying a burial ranged from two to forty, with an average of fifteen to twenty. Most of the types were such as occur on habitation-sites of the mature Harappa culture.

'Personal ornaments were sometimes worn by the dead...

'Besides pottery and personal ornaments, toilet objects occasionally formed a part of the grave-furniture. From the total number of graves found in 1937-46, twelve yielded each a handled copper mirror ; others produced mother-of-pearl shells ; one an antimony stick ; and one, a large shell spoon.

'It may be noted that some of the graves contained, besides a human skeleton, a few decayed animal bones. One grave included the bones of a fowl, together with a small handled lamp, placed at the feet of the dead'¹².

In one case, the body, probably of a female, was placed within a wooden coffin. There were also traces of some light-green substance over and around it¹³.

Extended inhumation, then, was the normal funeral practice of the Harappans at Harappa (no cemetery has as yet been identified at Mohenjo-daro) ; evidently, this was their practice elsewhere too,¹⁴ to judge from two recently-excavated sites within the Indian border—Rupar in District Ambala

¹¹ Wheeler (1947), particularly pp. 83-90 and 101-120.

¹² *Ibid.*, p. 86.

¹³ *Ibid.*, p. 87. This burial 'represents a mode customary in Sumer during a considerable period which overlapped and probably preceded that of Cemetery R 37', *ibid.*, p. 88. At the time of the excavation it was suspected that there was a reed-shroud below a part of the body, but this has now been disproved, K. A. Chowdhury and S. S. Ghosh in *Ancient India*, no. 7 (1951), p. 13.

¹⁴ It would be unfair if I do not mention here a case of Harappan cremation observed by me at Tarkhanwala-Dera (lat. 29°10' N.; long 73°10' E.) in Ganganagar District (north Rajasthan), 4 miles to the north of Anupgarh, in the course of my exploration (1950-53) in the dried-up valley of the Sarasvati. Here, at the top of a made-up platform, on which stood a modest Harappan settlement, was noticed, by excavation, an oblong stand-

ing cremation-ground, marked off by flatly-laid mud-bricks, in which there had been at least five cremations (pl. I). After each cremation, marked by ashes and bits of charred bone (sometimes collected in pots), the ground within the enclosure was levelled by a coating of clay or mud-bricks for the next cremation to take place. That the Harappans cremated at least five of their dead at this place seems established ; but the conclusion that extended inhumation was the normal practice of the Harappans need not be prejudiced by this single isolated instance, particularly as in the neighbouring Harappan site of Binjor-3 (lat. 29°10' N.; long 73°05' E.), 6 miles to the west of Tarkhanwala-Dera and 3 miles to the east of the Indo-Pakistan border, the existence of a cemetery was suspected, in the course of the same exploration, in the flat land to the west of the mound, where a large number of complete Harappan pots were found near the surface.

(Panjab)¹⁵ and Lothal in District Ahmadabad (Gujarat)¹⁶—which also have cemeteries with similar burials.

AREA (CEMETERY) H

Excavated between the years 1929-30 and 1933-34, Area H was, like R 37, very fruitful for human skeletal remains¹⁷. Here there were two 'strata' of burials (respectively called in this note Early and Late Cemetery H¹⁸, each characterized by its own method of burial: it was earth-burial in Early Cemetery H and pot-burial in Late. In the former, in the eastern section of the Area, complete bodies were seen laid in an extended way, while in the western section only fractional burials were met with. In Late Cemetery H, disarticulated bones, evidently collected after the exposure of the bodies, were found placed without any order at the bottom of the jars, too small to take complete bodies, except those of babies, which were found completely enclosed in an embryonic position.

In shape, fabric, slip and painted decoration, the pottery of Late Cemetery H is entirely different from that of the true Harappa pottery and is very easily distinguishable from the latter. It may be mentioned that this pottery also occurs here and there in the upper levels of the habitational mounds of Harappa. Even the pottery of Early Cemetery H had hardly anything in common with the typical Harappa, though the excavator hints at its possible derivation out of the latter as a result of a long period of development—a hypothesis difficult to sustain, notwithstanding his attempt to substantiate it on the basis of craniological data¹⁹.

It has been stated above (p. 3) that one of the objectives of the excavation of 1946 was to establish the stratigraphic relation between Cemetery R 37 and Cemetery H by means of a long trench. The excavation was pre-eminently successful in this, in that it clearly demonstrated that Late Cemetery H 'was not only later than R 37 but was subsequent to a deep intervening deposit of potsherds and other débris which indicated a considerable alteration of the site between the two cultures'²⁰. Though no burial of Early Cemetery H was encountered in the trench, observation showed that this cemetery too post-dated the débris.

That Cemetery H represents the influx of a new people at Harappa is amply established, but there is no evidence in regard to the archaeological affiliation of the people. Their identity with

¹⁵ *Indian Archaeology 1954-55—A Review* (1955), p. 9.

¹⁶ *Ibid.*, 1957-58 (1958), p. 10; 1958-59 (1959), pp. 14-15; 1959-60 (1960), p. 19.

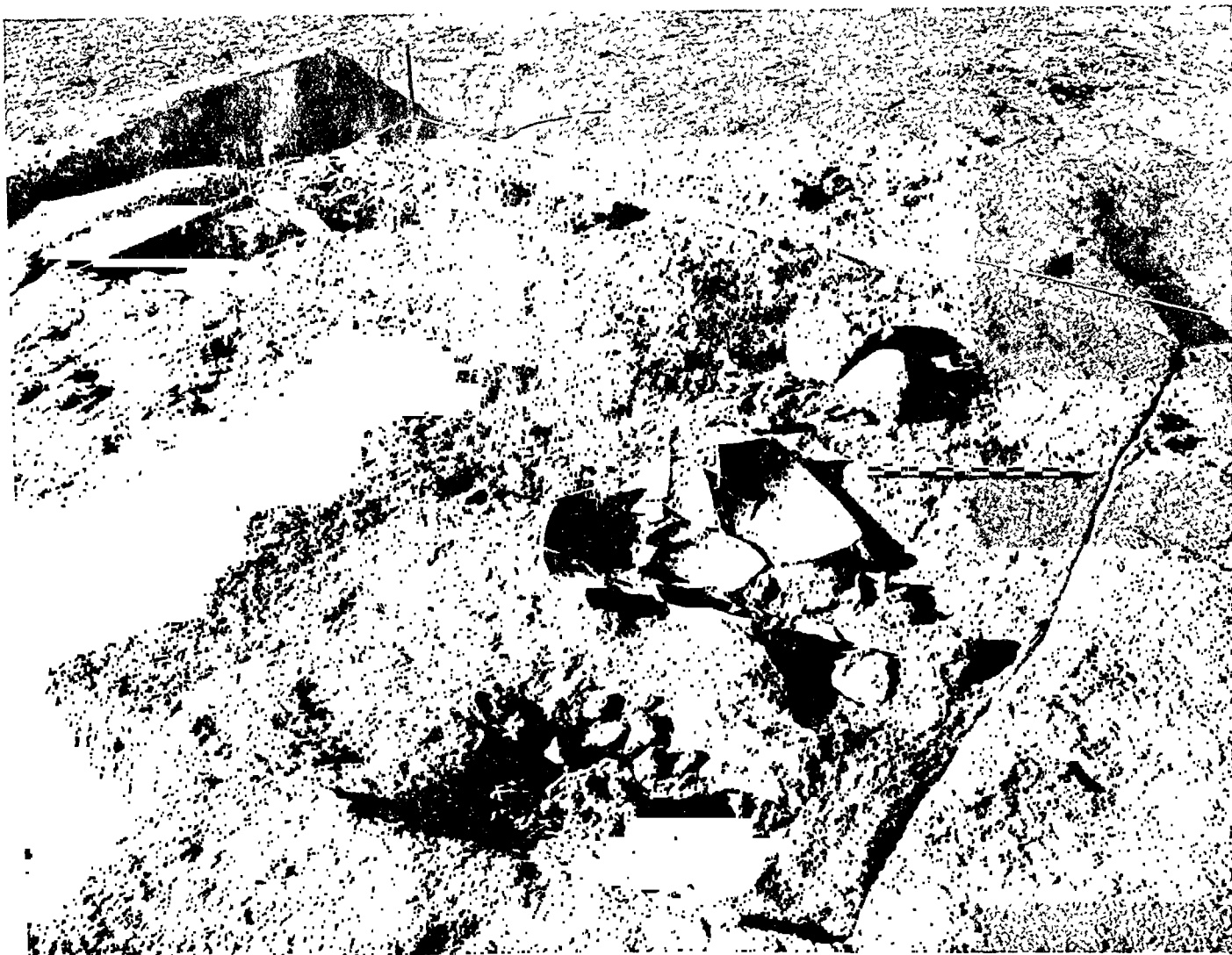
¹⁷ Vats, I, pp. 203-45. Three jars of Late Cemetery H were also exposed in 1946, Wheeler (1947), pp. 89-90.

¹⁸ These were respectively designated as Stratum II and Stratum I by Vats, and this system has been followed in the subsequent pages.

¹⁹ Vats, I, pp. 233-35. Wheeler (1947), p. 118, regards the two groups, Early and Late Cemetery H, as successive phases of the same culture. Cf. Stuart Piggott, *Prehistoric India* (Harmondsworth, 1950), p. 233. But the radical difference between the methods of burial in the

two cemeteries remains unexplained by this single-culture hypothesis.

²⁰ Wheeler (1947), p. 85. The published section, *ibid.*, pl. XXXIX, graphically demonstrates this. At the same time, this, together with the total absence everywhere at Harappa of any overlap between the Harappa and Cemetery H material, precludes any contact between the two cultures as the conquered and the conqueror or as of peaceful co-existence. Cf. B. B. Lal in *Ancient India*, nos. 10 and 11 (1954 and 1955), p. 151 n. As Wheeler now cautiously observes (1960), p. 56: 'At least it is wise at present not to assume a temporal continuity between the Harappan culture and that of cemetery H'.



TARKHANWALA-DERA : CREMATION-GROUND

the Aryans has been hesitatingly suggested²¹, but this lacks plausibility, for the relics of the Aryans should be widespread and not localized, as the Cemetery H relics are.

POST-CREMATION BURIALS

Both at Harappa and Mohenjo-daro were found, in different levels, large wide-mouthed pottery urns, containing smaller vessels, bones of animals and other objects. It has been surmised that they represent burials in which human bones surviving cremation were deposited after powdering²². As, however, out of over two hundred and thirty urns found at Harappa²³, only one contained an unburnt human bone (tibia), their evidence may be discounted in the present context.

CONCLUSION

Such, in brief, are the circumstances of the discovery of human remains in the excavations at Harappa. In the exposing of the skeletons and in their field-treatment and lifting, the Archaeological Survey of India invariably received help from the officers of its sister-organization, the Anthropological Survey of India, to which the skeletons were removed from the field for joining, final preservation, study and scientific report. It is a matter of gratification that the long-awaited report is now ready.

From the archaeological point of view, the following are the prerequisites to any conclusions that the anthropologist may draw on the ethnic affinities of the people whose remains are reported on in the following pages. The remains from R 37 are to be studied first, individually and as a whole, for they indisputably belong to the real authors of the Harappa culture and therefore provide the most reliable material for racially affiliating them. The results thus obtained should then be applied to the remains from Area G, which also seemingly belong to the mature Harappans. The (later) Early Cemetery H material may thereafter be compared and contrasted with the Harappan material, and finally should come the (latest) Late Cemetery H material. As more than one archaeological culture is involved, any mixing up of the material will doubtless produce erroneous results.

Harappa has the unique advantage of having two protohistoric cemeteries successively superimposed upon an authentic Harappan cemetery. The comparative results of the anthropological study of the remains of these cemeteries will be of immense importance from all points of view.

Finally, the results, in so far as they relate to the real Harappan remains, have to be correlated with those already obtained from Mohenjo-daro and those to be obtained from two Indian sites with Harappan cemeteries, viz. Rupar and Lothal, which, I understand, are receiving the expeditious attention of the Anthropological Survey of India.

²¹ Wheeler (1947), p. 81, but not in (1960); V. Gordon Childe, *New Light on the Most Ancient East*, 1st ed. (London, 1934), p. 223, but not in revised ed. (1954).

²² The evidence is summarized in Marshall, I, pp. 86-88.

²³ Vats, I, pp. 27, 158, 174-75, 195 and 252-55.

Demographic Notes on Harappa Skeletons

J. M. DATTA

NATURE OF THE POPULATION

The total number of skeletons is 260 only, the primary data have been given in page 13 of the 'Anthropological Introduction'.

The number whose age has been more precisely determined, i.e. within a certain range of time, is 107.

The skeletons obtained were not buried at one time. They belong to different periods of time. Their distribution has been given in *Table I* (Anthropological Introduction) page 13.

Sundbarg's age-categories of population are:

	A G E	I N	Y E A R S
	0-15	15-50	over 50
Progressive	400	500	100
Stationary	330	500	170
Regressive	200	500	300

This empirical relationship holds good all over the world both in space and in time.

Increasing the number of those who are between 0-12 years by one-fifth to get the number of 0-15 we find:

	A G E	G R O U P
	0-15	over 15
Cemetery H stratum I	39.6 (508)	38.4 (492) = 1000
Cemetery H stratum II	2.4 (92)	23.6 (908) = 1000
Mound Area	9.6 (384)	15.4 (616) = 1000
Area G 289	7.2 (313)	15.8 (687) = 1000
Cemetery R 37	0	108

The population of Mound Area is of the progressive type ; and that of Area G 289 of the stationary type. The other populations do not conform to any of these types. But having regard to the sex-ratio probably Area G 289 people were of the progressive type also.

Let us find out the sex-proportions as determined from skeletons. Unfortunately the sex of many subjects could not be determined ; and that of children has not been possible.

	MALE	FEMALE	UNDETERMINED
Cemetery H stratum I	11	21	13
Cemetery H stratum II	11	9	4
Mound Area	6	6	5
Area G 289	9	4	4
Cemetery R 37	38	55	15

The sex-ratios are given below. As the number of subjects, whose sex has been determined is very small, any accidental omission or failure to determine its sex, even of one, would effect the ratio seriously.

	SEX-RATIO PER 1000 MALES
Cemetery H stratum I	1909
Cemetery H stratum II	818
Mound Area	1000
Area G 289	444
Cemetery R 37	1450

The sex-proportions, except in the Mound Area, are abnormal. The excess or shortage of females may be explained by supposing that as Harappa was a central city—one of the joint capitals, the structure, both age-structure and sex-ratio, were artificial. Normally there would be shortage of females ; but if females are employed as slaves or impressed as labourers in certain periods, there would be an excess.

The proportion of older men i.e. 50 years and above is very small ; it is 5 out of 107. Even lowering the age-limit to 40 years, the total is 12. This fact also goes to show that the population of the city of Harappa was not representative or a good sample of 'the Harappa people'.

An attempt may be made to find out the general fertility rate, expressed as the number of children per 1000 females aged 15-44 years. Here all those who are above 12 and below 50 have been taken as the base. As sex of as many as 17 per cent has not been determined the rates found are necessarily inaccurate. But they give some idea about the population. They tend to confirm our conclusions stated above.

Females of reproductive age period i.e. all those who are between 12 and 50 years.

	JUVENILE	ADULTS	TOTAL	CHILDREN 0-12 YEARS	FERTILITY RATE
	(1)	(2)	(3)	(4)	(4) \times 1000/(3) \times 12
Cemetery H stratum I	2	18	20	33	137
Cemetery H stratum II	1	8	9	2	19
Mound Area	0	6	6	8	111
Area G 289	0	4	4	6	125
Cemetery R 37	3	52	55	0	0

With the data available we have not been able to reconstruct the age-pyramid, and find out the mean age.

AN ESTIMATE OF POPULATION IN HARAPPA AND MOHENJO-DARO

The capital cities of Harappa and Mohenjo-daro have been described in some detail by Stuart Piggot (*Prehistoric India, 1950*) and Sir Mortimer Wheeler (*The Indus Civilization, 1953*). In certain areas excavated beyond the workmen's quarters there appears to have been arrangements for pounding wheat into flour. It has been argued that much of the labour for this purpose was slave-labour. Both Wheeler and Stuart Piggot have described the elaborate bureaucratic machinery which was capable of organizing and distributing surplus wealth. Grain was stored as part of the governmental agricultural policy and municipal granaries or the preparation of flours was part of the controlled economy using organized labour.

One may therefore infer that there was considerable concentration of population at Harappa as well as at Mohenjo-daro. The question is, how many people actually lived either at Harappa or at Mohenjo-daro? We believe it is possible to make some kind of a rather rough guess.

'The combined floor-space of the twelve granaries (at Harappa) was something over 9000 sq. ft., and approximates closely to that of the Mohenjo-daro granary as originally planned' (Wheeler 1953, p. 22). The gross area of the Harappa granary is $12' \times 50' \times 20' = 12000$ sq. ft. From the plan of the granary at Mohenjo-daro as given by Wheeler at page 232 of his book, it appears that originally planned it extended over 8000 sq. ft. Later on additions were made and it occupied a space of 11260 sq. ft.

We shall take 12,000 sq. ft. as the area of the granary at Harappa and 11,260 sq. ft. as the area at Mohenjo-daro.

The height of the State granary has not been given by either of the authors, but it is possible to make some kind of an estimate.

Stuart Piggot says (p. 161) that the defensive wall of the citadel at Harappa was roughly 40 feet wide at the base and had an approximate height of 35 feet. That the walls of the granaries are buttressed shows that they were of considerable height. If the defensive walls of the citadel so

thick at the bottom rose to 35 feet only, the height of the granary walls certainly did not exceed that figure. One may take 35 feet to be the upper limit of its height.

Whatever may have been the total height, we have to deduct from it the thickness of the roof, some air space above the stacks of bags of grain or milled flour for ventilation and easy handling of the bags, and the height of podium to get the 'effective' height of the grain-stacks. The height of the podium being 4 feet and the roof, say, a foot or one and half feet thick; the air space being roughly $4\frac{1}{2}$ to 5 feet, we get an approximation of 25 feet as the 'effective height'.

The height of the granary at Mohenjo-daro can be roughly estimated from plate IX of Wheeler's book. It is about 5 times the height of the man standing at the bottom with out-stretched legs. So, up to the passage for ventilation, it is approximately 25 feet high. The breadth of the sub-structure as shown in figure VIII of the same book is about 15 feet.

We may now attempt to calculate the effective volumes of the two granaries at Harappa and Mohenjo-daro. At Harappa the volume is $12 \times 50' \times 20' \times 25' = 300,000$ cubic feet; at Mohenjo-daro $11,260 \text{ sq. ft.} \times 24 = 270,240$ cubic feet. The two figures are close to one another having regard to the estimates of height made already; though the height at Mohenjo-daro is 10% less than that at Harappa.

The aisle in the middle of the granary at Harappa is as broad as 23 feet; and there are open spaces between the sub-structures. We infer that grain could not have been stored in heaps, but were stored in bags. The presence of the circular working floors near the granary goes to show that grain was milled before storage.

As milled flour was stored in bags, some space is wasted at the corners, and in the interspaces between bags. We have been informed by several godown-keepers here in Bengal, that the volume occupied by flour is five-sixths of the total volume.

The volume occupied by milled flour is:

at Harappa	2,50,000 cu. ft.
at Mohenjo-daro	2,25,200 cu. ft.

The Punjab and Sind are wheat-producing countries. The Harappa people used wheat and barley (cf. Wheeler, p. 62). We have been informed by Sri Asoka Mitra, I.C.S., Registrar General of India that—

1 cu. ft. of imported common wheat weighs	21—22 seers.
1 cu. ft. of common Indian wheat weighs	25 seers.
1 cu. ft. of barley weighs	22 seers.

This is the weight as grain; but when it is milled and tightly packed, 1 cubic foot of common Indian wheat weighs as much as 29-30 seers.

As milling in ancient times was not as fine as in the present day, 1 cubic foot of wheat must have weighed less. We take it to have weighed 28 seers, or 0.7 maunds.

Consumption of food varies with age, sex and nature of daily labour. Adults consume more than old men or young ones; in the case of infants it is almost nil. Female consumption has been taken by Mulhall in the *Dictionary of Statistics* to be two-thirds that of a male. Modern research in England shows it not to exceed 85 per cent that of a male at certain ages.

Annual consumption of paddy per head, irrespective of age, sex and nature of work, has been taken to be 9 maunds (*Bengal Land Revenue Commission Report*, Vol. II, p. 106). And 20 maunds of paddy produce 13.5 maunds of rice. So the annual consumption of rice is 6 maunds per head.

Annual consumption of wheat per head is a little less, as wheat is more nutritious than rice. The standard diet which keeps a man fit prescribes 17 ounces of cereals a day, i.e. some 4.71 maunds per head per annum.

The actual consumption per head of the total population is likely to be less, as it includes children. But the standard diet includes many other items, which may not have been available in those early times. Further the consumption was likely to have been greater. For all these reasons, we take 4.71 maunds to be the annual consumption per head.

Drs R. C. Majumdar, H. C. Rai Chaudhuri and K. K. Datta in their *Advanced History of India*, say: 'Wheat was the principal article of food, but barley and palm-date were also familiar. They also used mutton, pork, fish and eggs' (p. 18).

Assuming that the grain stored was for a year's consumption (as milled wheat or barley is not likely to remain unaffected by mildews and other fungi and insects for more than a year) the population of the two cities of Harappa and Mohenjo-daro may be estimated thus:

Volume of milled grain at Harappa	2,50,000 cu. ft	
Weight of milled grain	$2,50,000 \times 0.7$ mds	
Number of persons at Harappa	$\frac{2,50,000 \times 0.7}{4.71}$	= 37,155
Similarly the population at Mohenjo-daro is	$\frac{2,25,200 \times 0.7}{4.71}$	= 33,469

We do not lay stress on the particular figures; but they do give us an idea of the sizes of the population.

'In the matter of actual plan and lay-out the two cities are strikingly similar, and Wheeler's recent work at Harappa has thrown much light on the significance of this uniform planning' (Stuart Piggot, p. 159).

The suggested street-plan of Mohenjo-daro as shown at page 25 of *The Indus Civilization* shows it to be almost a square. The site plan of Harappa at page 17 shows it to be a square.

Wheeler says: 'It (Harappa) overlies and adjoins the mounds of the ancient city, which appears to have had a circuit of not less than 3 miles'..... (p. 16).

Stuart Piggot says 'The mounds which represent the city of Mohenjo-daro today cover a square mile.....' (p. 165).

The area of Harappa is a little more than $\frac{3}{4}$ sq. miles or 480 acres. We take it to be 500 acres in round numbers, as the full city cannot be recovered on account of brick-robbing during the construction of the Lahore-Multan Railway.

The area of Mohenjo-daro, we take to be 640 acres.

The density of population is at

Harappa	74 persons per acre.
Mohenjo-daro	52 persons per acre.

It appears that Harappa was more populous, and the greater density indicates that it was the older city. At Mohenjo-daro the granary was expanded by some 38 per cent between Period I and Period II B—which shows that it was a growing city. Non-extension of the granary and high density at Harappa indicate that the authorities for some reasons unknown to us did not like the extension of the city.

What this high density at such a remote time (Circa 2000 B.C.) means, we have not been able to guess. But to appreciate the problem, we give certain data below :

(a) *Calcutta*: The density of persons per acre at Calcutta during the census period has been :

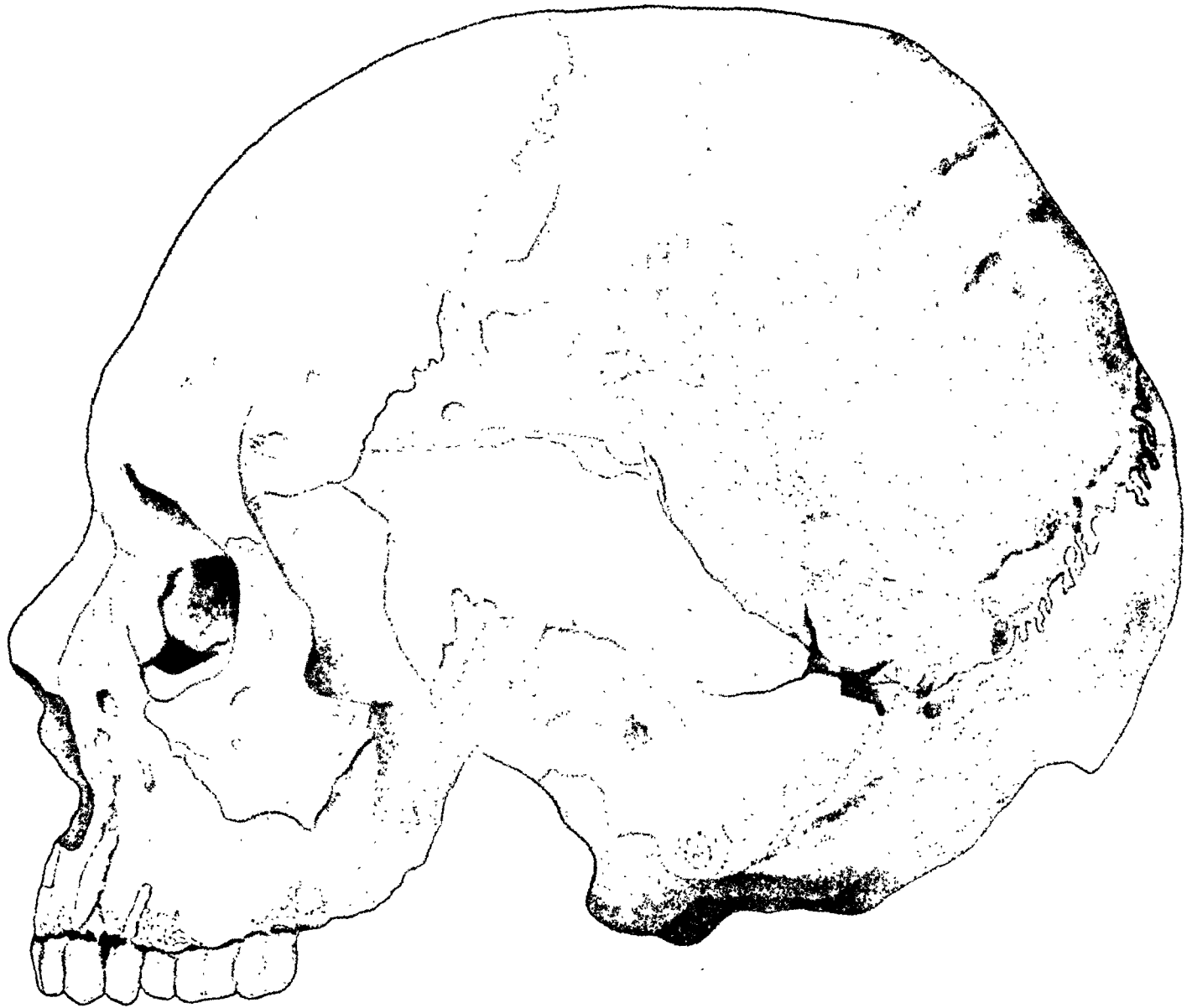
	CALCUTTA INCLUDING FORT AND MAIDAN	MUNICIPAL CALCUTTA
1872	25	35
1881	24	33
1891	27	37
1901	33	45
1911	36	50
1921	38	52
1931	42	58
1941	76	107
1951	92	130
1961	106	148

(b) *Gaur* : In the 15th century, 'the capital city of Gaur (in Bengal) was beautified and expanded to an extent of over 20 sq. miles with a population of over 600,000' (M. N. Gupta, *Land System of Bengal*, p. 156). The density is 47 per acre.

(c) *Vijayanagar* : Abd-er-Razzak visited the city in 1443. He says 'from the northern gate of the outer fortress to the southern is a distance of two statutory *parsangs* (about 7 or 8 miles) and the same with respect to the distance between the eastern and western gates' (Vincent Smith, *Oxford History of India*, p. 309).

The area enclosed is more than 50 sq. miles. Domingos Paes, a Portuguese, visited it about 1522 in the reign of Krishna Dev Raya when the Empire of Vijayanagar was at the height of its glory. 'Paes found a difficulty in estimating the size of the city, because the hills prevented him from seeing the whole at once. So far as he could judge, it was as large as Rome. The houses were said to exceed 100,000 in number. If that guess be near the truth, the population cannot be less than half a million (ibid p. 310).

As there is no reason to think of the diminution of the city in extent between 1443 and 1522, the density works out to 16 per acre. As hills and dales and rivulets were enclosed within the outer wall, the density for residential areas was greater, say 2 or 3 times the above figure. Even then it does not approach that of Harappa.



Norma Lateralis

Human Remains from Harappa

P. GUPTA, P. C. DUTTA & A. BASU

ANTHROPOLOGICAL INTRODUCTION

The human remains of altogether 260 individuals were recovered by excavations in Harappa between the years 1925-26 and 1946-47. Some individuals are represented by tiny fragments alone; but in many cases the entire skeleton is available, although often badly damaged by chemical action or earth-pressure. The sites yielding bones are as follows:

- (a) Cemetery H stratum I—jar burials
- (b) Cemetery H stratum II—open burials
- (c) Mound AB, F and Area J
- (d) Area G 289
- (e) Cemetery R 37

Their archaeological position has been indicated by Mr A. Ghosh, Director-General of Archaeology in India, in an introductory chapter entitled 'The Archaeological Background'.

Table 1 gives details of site, sex and age of all skeletal remains recovered.

TABLE 1
SITE, SEX AND AGE DISTRIBUTION OF ALL SKELETONS

Sites	Infant (Birth to 3 years)	Child (3 to 12 years)	Juvenile*	Male Adult (Above 20 years)	Female Adult (Above 18 years)	Adult Sex Indeter- minable	Total
Cemetery H St I	20	13	4	11	19	11	78
Cemetery H St II	—	2	1	11	8	4	26
Mound Area	2	6	—	6	6	5	25
Area G 289	—	6	—	9	4	4	23
Cemetery R 37	—	—	2	38	55	13	108
Total	22	27	7	75	92	37	260

* Juveniles are not shown sexwise since all of them could not be properly determined.

Cemetery R 37 yielded the largest number of individuals, namely, 108. Area G 289 yielded 23 ; and 25 came from Mound Areas. The remains of 78 individuals were recovered from jar burials in Cemetery H stratum I, while stratum II, where open burial was the practice, yielded 26 individuals. Particulars of individual skeletons have been appended at the end.

The circumstances under which each skeleton was recovered from the graves have been described in detail by Vats (1940, Vol 1 : 106-110, 153-156, 195-245) in '*Excavations at Harappā*' and Wheeler (1947 : 83-90) in his paper on '*Harappa 1946 : The Defences and Cemetery R 37*', excepting for some from Cemetery R 37 excavated earlier. The detailed description on them have been noted on pages 18 to 20.

When first recovered the bones were in a very fragile condition. They were chemically strengthened before measurement. Some skulls and long bones were well preserved, but distorted in a manner which rendered them unsuitable for measurement. Some were so badly crushed that neither drawing nor measurement was considered to be of any use. Out of 260 skeletons, only 86 were finally utilized for purposes of report. The table below gives the number as well as site, sex and age of the skeletal remains used in the present Anthropological Report.

TABLE 2

SITE, SEX AND AGE DISTRIBUTION OF SKELETONS USED IN THE REPORT

Sites	Adults		Juvenile	Children	Total
	Male	Female			
Cemetery H St I	3	12	2	1	18
Cemetery H St II	7	6	—	—	13
Mound Area	1	2	1	—	4
Area G 289	7	3	—	5	15
Cemetery R 37	15	19	2	—	36
Total	33	42	5	6	86

As regards children's crania and their extremity bones, basic measurements and indices have been given in the Collective Tables. But these bones have not been otherwise utilised for the Report.

TECHNIQUE

In general, measurements were taken according to Martin's (Martin and Saller 1956) method, except when specified otherwise. Each measurement was taken several times by two or three craniometrists in order to reduce personal error to the minimum. Instruments and apparatuses manufactured by Messrs Hermann Richenboch and Sons and GPM Gneupel, both of Switzerland, were used in taking measurements and drawings. Auricular height was measured by Davidson Black's callotometer after setting the skull on Mollison's craniophore. It was not possible to take angular measurements directly on the skulls, for they were too fragile and unsuitable for proper orientation on the

craniophore. Angles were consequently drawn and measured on the median sagittal curve. Mandibular angle, height of ramus and mandibular length were measured with the help of Hambruch's mandibulometer. Reid's osteometric board was used for measuring long bones. Permanent molar teeth, in which high degree of attrition had caused loss of original dimensions, were not considered for measurements.

Basic measurements and indices are furnished in the Collective Tables A to P placed at the end. Linear and curvilinear measurements are given in millimeter. In the tables each measurement is shown according to the prescribed definition of Martin or Wilder (1920), as the case may be; and each measurement number is preceded by the initial of the respective authors. For example, maximum cranial length was measured according to Martin; it is denoted at the top of the column as M 1 (see Collective Table, p. i). The numbers on the skeletons given by the Archaeological Survey of India have been retained in the present Report.

ESTIMATION OF CRANIAL CAPACITY AND STATURE

The cranial capacity could not also be determined by Mollison's (1938 : 626) mustard-seed method. Only four skulls, belonging to distinguishing types, and coming from different periods, were measured directly. Then the results were compared with findings obtained through the application of various formulae. It was observed that Lee's (1901 : 243) Naqada formulae came closest to the results of direct measurements.

Lee's Naqada formulae are noted below :

$$\begin{aligned}\text{Male } C &= 0.000352 \times (L \times B \times H) + 372.39 \\ \text{Female } C &= 0.000416 \times (L \times B \times H) + 189.81 \\ &\text{(where H denotes vertical porion height).}\end{aligned}$$

The determination on the four crania are given below :

TABLE 3

Skull No.	Sex	Mustard-seed method (a)	Lee's mean formulae (b)	Lee's Naqada formulae (c)	Lee-Pearson's Inter-racial formulae (d)	D i f f e r e n c e		
						(a) — (b)	(a) — (c)	(a) — (d)
I S 11	M	1380.00	1392.23	1402.50	1427.50	-12.23	-22.53	-47.50
II S 18	M	1400.00	1391.08	1401.31	1426.26	+ 8.92	- 1.31	-26.26
Ski 1	M	1450.00	1389.61	1399.77	1424.67	+60.39	+50.23	+25.33
H 798/A 1	F	1305.00	1254.35	1279.47	1278.67	+50.65	+25.53	+26.33

When auricular height was not available Lee-Pearson's (1901 : 247) inter-racial formulae were employed, which are given below :

$$\begin{aligned}\text{Male } C &= 524.6 + 0.000266 \times L \times H' \times B \\ \text{Female } C &= 812.0 + 0.000156 \times L \times H' \times B \\ &\text{(where H' denotes basion-bregma height).}\end{aligned}$$

While estimating the stature of the living from dry long bones Pearson's (1899 : 196) regression formulae, Dupertuis and Hadden's (1951 : 15-53) 'general formulae' and Manouvrier's* (1893 : 347-402) tables were employed.

AGE AND SEX

Estimation of age at death of an individual was based on the extent of closure of sutures of skull and degree of ossification of bones. Eruption of tooth was also one of the criteria in the case of non-adults.

As regards determination of sex, there was difficulty as all relevant bones were not often available. As has already been mentioned, the majority of skeletons were in a fragmentary condition. Certain anatomical features of bones have a high degree of diagnostic value in regard to sex, and Krogman (1946 : 154) is of opinion that when portions of skeletons are available, the degree of accuracy is as follows :

Pelvis alone	95%	accuracy
Skull alone	92%	accuracy
Pelvis + skull	98%	accuracy
Long bones alone	80-85%	accuracy
Long bones + skull	95%	accuracy
Long bones + pelvis	98%	accuracy

In the present Report, utilizing Trevor's (Mukherjee, Rao and Trevor 1955:9-10) principle (modifying slightly), laboratory sexing of the entire skeletal material is based on anatomical appreciation of all the available bones pertaining to an individual. Only adult specimens were considered and the result is shown in Table 4. In many cases, bones were broken beyond repair and unsuitable for measurement, but they could still be used for sexing.

It is apparent from Table 4 that when the total skeletons are considered, laboratory sexing shows slightly higher proportion of females (55.09%) than males (44.91%), when M and M ? are taken together and compared with F and F ? also taken together.

When different stratum is taken into consideration it is observed that in Cemetery R 37 female is predominant (59.14%) over male (40.86%). Similarly in Cemetery H jar burials female population was numerically greater (63.33%) than male (36.67%). Reverse is the case of cemetery H open burials, i.e. 57.89% male and 42.10% female. In Area G 289 male was in overwhelming majority (69.23%) over female (30.77%).

The present study being the anthropological complement of Vat's and Wheeler's Reports on archaeology, its primary object is to determine the physical characteristics of the Harappāns.

* Following Dwight's (1894 : 16) recommendation subtraction of 2 cm. from the mean of the total approximations was not done.

SQUARE (CEMETERY) R 37

The cemetery in Square R 37 at Harappā, located on a slightly raised ground to the south of the main habitation-area brought to light the only regular cemetery of the inhabitants of Harappā belonging to the true Harappān period. Altogether, skeletons of 108 individuals were recovered from fifty-seven burials of the cemetery in different seasons between the years 1938-41 and 1946-47.

Of these graves forty-seven were exposed in earlier seasons and the remaining ten in 1946, short notes on the burials of the latter ones have been furnished by Mr H. K. Bose (Wheeler 1947; 86-89). The graves exposed in earlier seasons, however, have not been described previously, and, therefore, short notes on them are presented below :

- 1 *Burial No. H. 779 and H. 783* : Multiple burial ; North South orientation ; laid in supine position ; head turned towards the East ; No. of skulls five ; bones generally in decayed condition.
- 2 *Burial No. H. 780* : Fractional burial ; No. of skull one.
- 3 *Burial No. H. 781* : Fractional burial ; North South orientation ; No. of skull one ; in extremely decayed condition.
- 4 *Burial No. H. 782* : Complete burial ; North South orientation ; laid in supine ; head turned to the East ; No. of skull one ; bones in decayed condition. Two animal ribs are on each side of the head.
- 5 *Burial No. H. 791* : Fragmentary skeleton ; North South orientation ; laid in supine ; bones in extremely decayed condition.
- 6 *Burial No. H. 791* : Fragmentary skeleton ; North South orientation ; laid in supine ; head turned towards East ; No. of skull one ; bones generally in decayed condition.
- 7 *Burial No. H. 792* : Fractional burial ; bones in decayed condition.
- 8 *Burial No. H. 793* : Complete burial ; North South orientation ; laid on left side ; head facing East ; No. of skull one ; bones in distorted condition.
- 9 *Burial No. H. 793/A* : Complete burial ; North South orientation ; lay prostrate ; head facing downward ; large skull one in number ; bones generally well preserved.
- 10 *Burial No. H. 793/B* : Fractional burial ; head tilted on right cheek ; No. of skull one ; bones in fair condition.
- 11 *Burial No. H. 794* : Complete burial ; North South orientation ; laid on right side ; head facing West ; No. of skull one ; well preserved condition. Animal rib near foot.

- 12 (i) *Burial No. H. 794/A* : Complete burial ; North South orientation ; laid on supine ; head tilted westward ; No. of skull one ; bones in decayed condition ; arm bone of another individual present.
(ii) *Burial No. H. 794/B* : One piece of human bone only represented this burial.
- 13 *Burial No. H. 795* : Fractional burial.
- 14 (i) *Burial No. H. 795/A* : Complete burial ; North South orientation ; laid on right side ; head tilted westerward ; No. of skull one ; bones in poor state of preservation.
(ii) *Burial No. H. 795/B* : No bones found ; treated as part of H. 795/A.
- 15 *Burial No. H. 796* : Fractional burial ; comprised three fragments of long bones only.
- 16 *Burial No. H. 796/A* : Fragmentary skeleton ; North South orientation ; laid in supine ; this burial treated as a part of H. 796.
- 17 *Burial No. H. 796/B* : Fractional burial ; head turned on cheek ; No. of skull one ; bones in fair preservation. Burial Nos. H. 796, H. 796/A, H. 796/B could form a single burial.
- 18 *Burial No. H. 797* : Fractional burial ; only one piece of long bone represented in this burial.
- 19 *Burial No. H. 798* : Multiple burial ; No. of skulls six. Animal bones present.
- 20 (i) *Burial No. H. 798/A* : Fragmentary skeleton ; North South orientation ; laid in supine ; head resting on frontal region ; No. of skulls two.
(ii) *Burial No. H. 798* : No bones found. Burial Nos. H. 798/A and H. 798/B treated as one burial.
- 21 *Burial No. H. 799* : Fractional burial ; North South orientation ; laid on left side ; head facing East.
- 22 (i) *Burial No. H. 800* : Fragmentary skeleton ; North South orientation ; laid in supine.
(ii) *Burial No. H. 800/A* : Represented by animal rib only.
(iii) *Burial No. H. 800/B* : No bones found. Burial Nos. H. 800, H. 800/A and H. 800/B treated as a single burial.
- 23 *Burial No. H. 801* : Fractional burial ; only two pieces of bones found.
- 24 *Burial No. H. 800/A* : Complete burial ; North South orientation ; laid in supine ; head lay detached from the body ; No. of skull one. Animal rib present.
- 25 *Burial No. H. 801/B* : Multiple burial ; No. of skulls two. Two animal bones present of which one was identified as cattle horn.
- 26 *Burial Nos. (i) H. 802 and (ii) H. 802/A* : Fractional burial ; comprised a large number of big bones. The latter burial had a fragment of a skull.
(iii) *Burial No. H. 802/B* : Fractional burial ; only a few pieces of human bones represented. Burial Nos. H. 802, H. 802/A and H. 802/B treated as a single burial.
- 27 *Burial No. H. 803* : Fractional burial ; North-Northeast to South-Southwest orientation ; laid on right side ; head facing west ; bones in extremely fragmentary condition. Animal bone present.
- 28 *Burial No. H. 803/A* : Fractional burial ; only two pieces of bones and a piece of a skull present.
- 29 *Burial No. H. 804* : Complete burial ; North South orientation ; laid on right side ; head facing West ; only part of a skull survived.
- 30 *Burial No. H. 805* : Fractional burial ; head tilted ; No. of skull one ; bones in fair preservation.

- 31 *Burial No. H. 805/A* : Fractional burial ; North South orientation ; laid prostrate ; fragmentary skeleton ; piece of skull only.
- 32 *Burial No. H. 806* : Complete burial ; North South orientation ; laid supine ; head tilted slightly eastward ; one well preserved skull ; bones in extremely decayed condition. Animal ribs and two fragments of leg bones of another person found.
- 33 *Burial No. H. 806/A* : Complete burial ; North South orientation ; laid in supine ; head facing East ; No. of skull one.
- 34 *Burial No. H. 807* : Fractional burial.
- 35 *Burial No. H. 808* : Fractional burial ; North South orientation ; laid in supine ; fragmentary skeleton.
- 36 (i) *Burial No. H. 810* : Complete burial ; North South orientation ; laid in supine ; head facing East ; No. of skull one ; bones in extremely decayed condition.
(ii) *Burial No. H. 810/A* : No bones found. Burial H. 810 and H. 810/A treated as a single burial.
- 37 (i) *Burial No. H. 811* : Fractional burial ; head tilted on right cheek ; No. of skull one.
(ii) *Burial No. H. 811/A* : No bones found. Burials H. 811 and H. 811/A treated as one burial.
- 38 (i) *Burial No. H. 812* : Fractional burial ; North South orientation ; laid in supine ; head facing East ; No. of skull one ; bones in decayed condition.
(ii) *Burial No. H. 812/A* : No bones found. Nos. (i) and (ii) treated as one burial.
- 39 (i) *Burial No. H. 813* : Fragmentary body ; North South orientation ; laid in supine ; head facing East.
(ii) *Burial No. H. 813/A* : No bones found. This burial treated as part of burial H. 813.
- 40 *Burial No. H. 814* : Fragmentary skeleton ; North south orientation ; laid in supine ; lower jaw pointing eastward ; No. of skulls two. Some stray human bones found.
- 41 *Burial No. H. 815* : Fragmentary skeleton ; North South orientation ; laid in supine.
- 42 (i) *Burial No. H. 816* : Fragmentary skeleton ; Southeast to Northwest orientation ; laid prostrate ; head facing downward ; No. of skull one. Bones of other individual present.
(ii) *Burial No. H. 816/A* : No bones found. This burial treated as part of H. 816.
- 43 *Burial No. H. 817* : Complete burial ; North South orientation ; laid in supine ; head facing skyward ; No. of skull one ; bones in extremely decayed condition. Bones of bird present.
- 44 *Burial No. H. 818* : Complete burial ; North South orientation ; laid in supine ; head facing skyward ; bones well preserved.
- 45 *Burial No. H. 819* : Complete burial ; North South orientation ; laid in supine ; head facing eastward ; No. of skull one ; bones mostly decayed condition.
- 46 *Burial No. H. 820* : Multiple burial ; North South orientation ; laid on left side ; head facing eastward ; No. of skull three.
- 47 *Burial No. H. 821* : Complete burial ; North South orientation ; laid in supine ; head slightly tilted eastward ; No. of skull one ; bones in partly decayed and partly well preserved condition.

Out of 47 burials 15 were complete, 4 multiple and 15 fractional comprising collections of dismembered bones.

MATERIAL

The collection comprises materials varying from complete bones of individual skeleton to only a few bits representing one individual. Only thirty-six well-preserved crania and mandibulae of Cemetery R 37 have been utilised for osteological study and report. These thirty-six individuals represent 15 adult males, 19 adult females and 2 juveniles, but no children. While non-adults are not well-represented, as it ought to have been in a regular cemetery, children's skeletons are conspicuously absent. The age and sex distribution of the material, which is detailed below, reveals an interesting fact that, with rare exceptions, the majority of them died when they were at the prime of their life. Only one woman (H 805) seems to have enjoyed a long life.

TABLE 5

SEXWISE AGE DISTRIBUTION OF CEMETERY R 37 SKELETONS

AGE	JUVENILE	18 - 21 YEARS	21 - 25 YEARS	25 - 30 YEARS	30 - 40 YEARS	40 - 50 YEARS	50 - 60 YEARS
MALE	H 801 (B)	—	H 820 (iii)	H 779 (e), H 793, H 794, H 796 (B), H 798 (A), H 798 (B), H 798 (C), H 806, H 793 (B), H 811, H 818	Skl. 10, H 793(A)	Skl. 1	—
FEMALE	H 798/A2	H 817	H 795/A	H 779 (a), H 804, H 788, H 806 A, H 812, H 816, H 820 (II), Skl. 2, H 791/A, H 798/A I	H 780, H 798 (a), H 779 (c), H 801/A	—	H 805

Age of two women H 779 (d) and H 820 (I) could not be estimated but they undoubtedly were adults.

A. CRANIA

Detailed descriptions of individual skull of Cemetery R 37 have been furnished below. The measurements of skulls and extremity bones are produced in the Collective Tables appended at the end. Juveniles have not been taken into account for the determination of physical types, but their measurements and observations have been incorporated in the Collective Tables (A—B and G—H).

SKL. H 779 (a) [Figs. 1, 2; Pl. XVIII]

The skull with mandible belongs to an adult female of about 30 years of age. The skull is very badly preserved and is warped. Part of frontal and parietal bones of both sides are missing. Mastoids are small and the muscular ridges are not developed. Contour in norma verticalis (Sergi 1899 : 20) appears to be *elliptical* and the side walls are nearly flattened. Basilar suture is united and the vault sutures

show indications of beginning union. The skull is long (182.0 mm) and medium in height, the length-auricular height index being 60.71 (orthocranic). The orbits tend to be rectangular and are mesoconchic (right OI 84.44? and left OI 79.07). Nasal aperture is narrow and the nasal index lies at the border of leptorrhine and mesorrhine (NI 46.94). Palate is deep and *paraboloid* in shape. All the maxillary teeth are fairly intact, only crowns of upper left M_2 and M_3 are partially broken.

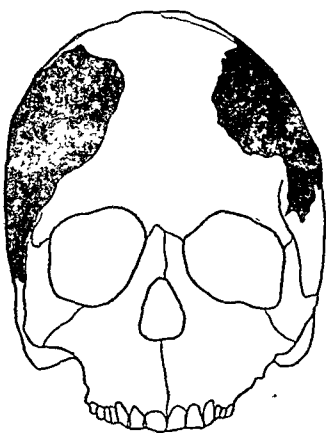


Fig. 1

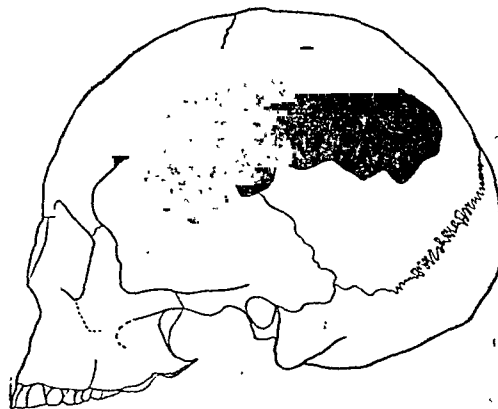


Fig. 2

Mandible was broken and had to be repaired before measurements. The lower dental arcade is narrow. The width of the dental arcade, measured between the outer margin of the second molars, is 51 mm. The depth of the symphysis is 36 mm.

SKL. 779 (c) [Fig. 5]

Skull is that of an adult female approximately 35 years of age. It is in a very poor state of preservation. Right side of the cranium has disintegrated producing granular surface. Supraorbital ridges are not perceptible, mastoids small, and muscular ridges are only moderately developed. The basilar suture is closed, while the coronal and the sagittal have started closing. Forehead is narrow, high and vertical with almost parallel side-walls. Viewed from above the skull is *elliptical* in shape. From the side, the vault appears to be high with flattened temples. Occiput is protruding and shelved abruptly downwards and forwards from the superior nuchal line. The skull is dolichocranic (L-B Index 66.30?) and acrocranic (B-H Index 106.56?). The orbits are rectangular, being hypsiconchic at right (OI 85.00) and mesoconchic at left (OI 82.05). The calculated cranial capacity of the skull is 1198.35 c.c. The depression at nasion is medium and the nose falls in chamaerrhine class (NI 53.33). The palate is short, wide and parabolic. Maxillary teeth are all relatively small sized.

Lower jaw is not preserved.

SKL. H 779 (d)

The skull is badly damaged; the calva, excepting the basicranii and part of the frontal bone, is missing. The skull is that of an adult female; the supraorbital ridges are not marked and the nasion

is only slightly depressed. The existing right orbit tends to be rectangular and mesoconchic (OI 80.49). A few measurements could be taken on the skull. Three molar teeth of each side of the maxilla are present.

No mandible.

SKL. H 779 (e) [Figs. 3, 4, 6]

The skull appears to be that of a male in the prime of life. The skull is complete without mandible, only the posterior portion of the skull vault is broken. Supraorbital ridges are prominent, having large mastoids and well-developed muscular impressions. Basicranial synchondrosis has completed its ossification, while ectocranial sutures are open. The forehead is receding and slopes back posteriorly in a low but regular curve upto the inion, and the nuchal region shelves abruptly downwards and forwards. The occiput is markedly protruding (*occiput en chignon*) and retreats sharply from inferior nuchal line. On the whole the skull is long, narrow and moderately low, having almost

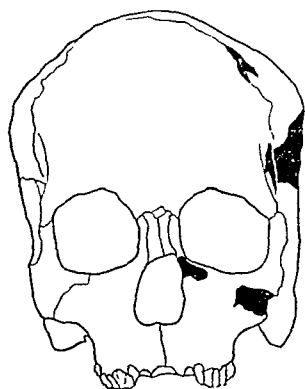


Fig. 3



Fig. 4

parallel side-walls. The skull is hyperdolichocranic (L-B Index 68.06) and on the border of orthocranic and chamaecranic (L-AH Index 58.90). Glabella is well developed and the nose is sunken at the root. The nose is concave, long and narrow, being leptorrhine (NI 41.51). The inferior border of the nasal aperture is *amblykraspedotic*. The nasal bones are wing-shaped with medium depression at the root. Vertical contour is somewhat *ellipsoides* in shape and *phaenozygous*. The subnasal is only moderately prognathous. The palate is short, deep and *upsiloid* in shape. All the maxillary teeth have cut but the incisors and left canine have fallen out.

SKL. H 780 [Figs. 7, 8, 11]

The skull is that of an adult female between 30 and 40 years of age at the time of death. The skull is in a fairly good state of preservation and complete excepting for the right zygomatic arch, tip of the left mastoid process, styloid process and squama of the right temporal. It is without mandible. Skull is smooth, gracile with medium supraorbital ridges and small mastoids. Muscular impressions are ill marked. Subnasal part of the maxilla is directed forward presenting a mild degree of subnasal

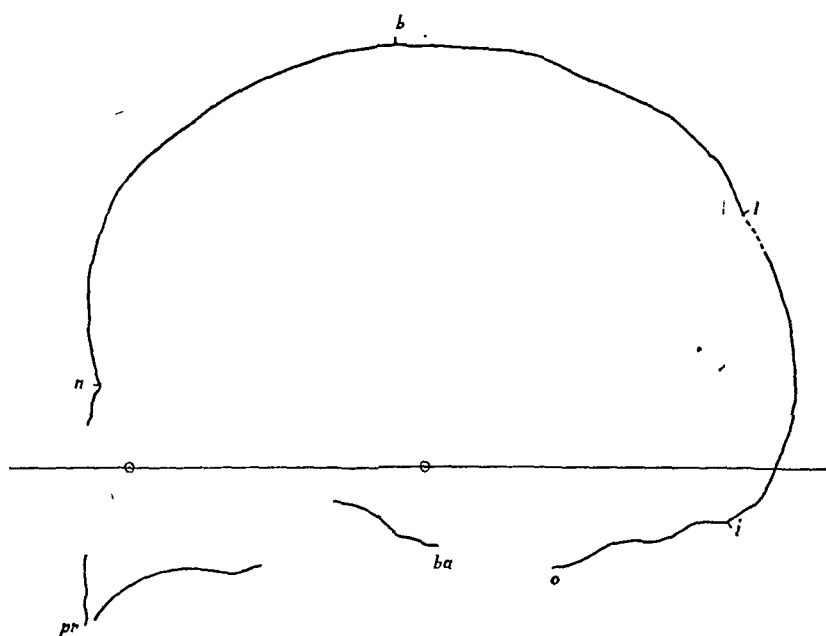


Fig. 5 Skl. H 779 (c)

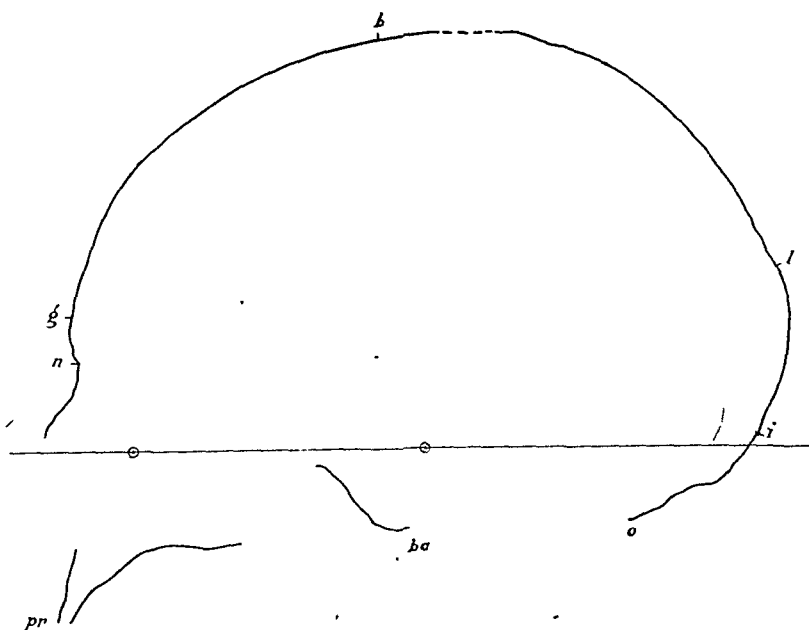


Fig. 6 Skl. H 779 (e)

MID-SAGITTAL CURVE ($\frac{1}{2}$ NATURAL SIZE)

prognathism. Seen from above, the outline of the skull is pentagonoides in shape. The skull is sub-mesocranic (L-B Index 75.69) and orthocranic (L-AH Index 61.88). The forehead is medium in height and is slightly receding. The vault appears to be well arched with smooth contour line and the occipital

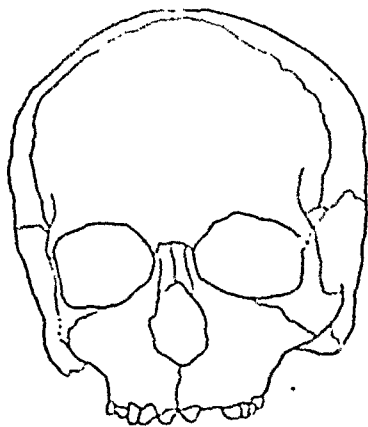


Fig. 7

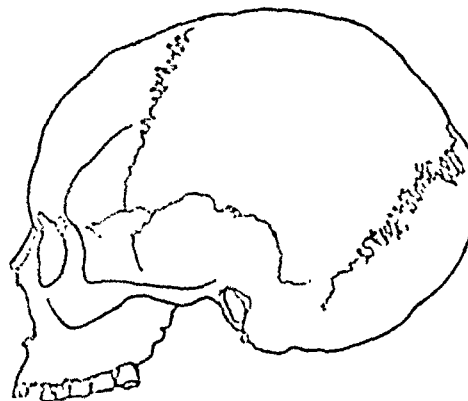


Fig. 8

region is moderately protruding. The orbits are low, rectangular with rounded angles and are mesoconchic (right OI 76.19 and left OI 79.52) in form. The nasal bones are wing-shaped with moderately depressed nasion and slightly concave nasal bridge. The nose is mesorrhine (NI 47.92), the inferior border of the pyriform aperture is *oxykraspedotic*. The teeth of the right maxilla, excepting PM_1 and PM_2 , are intact, while left is devoid of lateral incisor and canine which have fallen out *post mortem*. The upper dental arcade is *upsiloid* and the palate is deep.

SKL. H 788

The skull which is in a very poor state of preservation belongs to an adult female. Unfortunately, the skull is compressed and very badly damaged; the entire vault of the left half and basicranii is missing, thus very few measurements could be taken on it. Some portion of face and palate are surviving. Mastoid is small, the supraorbital ridges are absent and superior orbital margins are sharp. Glabella is not prominent and there is only little depression at the nasal root. Excepting for the central incisors, which have fallen out, all the other maxillary teeth are intact. Palate is deep and *paraboloid*. Basilar suture is united, while the vault sutures are open.

Mandible is broken. The right half of the mandible bears all the teeth but the left one has the incisors and canine.

SKL. H 791/A

The skull belongs to that of an adult female. It is smooth-contoured and gracile, having small mastoids with weak supraorbital ridges and prominent frontal eminences. The facial portion is damaged and distorted, particularly the right side. Right maxilla and zygoma are pushed backwards and inwards, due probably to some heavy pressure, while the left side also received the impact of the pressure of earth. Basilar suture is closed and coronal and sagittal sutures have just started

closing, while lambdoid suture is open. Contour of the norma verticalis is *ovoïdes* with moderately projecting occiput. The forehead is medium and vertical. The vault is somewhat low. The skull is dolichocranic (L-B Index 72.99), orthocranic (L-AH Index 59.77) and metriocranic (B-AH Index 81.89). Only the right orbit could be utilised for measurement, it being hypsiconchic (OI 91.67 ?).

The mandible is found in pieces having slightly absorbed margin with some of the teeth intact.

SKL. H 793

The skull is that of an adult male. It is not in a good state of preservation and had to be restored. The chief defects are as follows: the greater part of the facial region, part of the basis cranii, little of the left parietal and places around both the pterions are missing. The supraorbital ridges are prominent and the skull shows strong musculature. Norma verticalis is *byrsoides* in outline, narrowed in front and expanded at the parietals. From the side, the forehead is retreating and passes into a faintly arched vertex; the occiput is moderately protruding with a sharp retreat at the nuchal region. The glabella is prominent and the nose is sunken at the root. The skull is hyperdolichocranic (L-B Index 68.91) with somewhat laterally compressed side-walls, chamaecranic (L-AH Index 57.51 ?) and metriocranic (B-AH Index 83.46 ?). All the right maxillary teeth are intact. At the left PM₂ and M₃ are present. The cubic capacity of the cranium is euencephalic i.e. 1375.33 c.c.

The mandible which was obtained in fragments is restored, whose left coronoid is missing. All the mandibular teeth numbering sixteen are found intact in their sockets and teeth are only moderately worn down. Chin is prominent, corpus massive and maximum width of the ascending ramus is 44.0 mm.

SKL. H 793 (A) [Figs. 9, 10, 12; Pl. XIX]

The skull is massive in structure and belongs to an adult male between 30 and 35 years of age. It had to be restored before measurement. In absolute dimensions of certain characters the skull

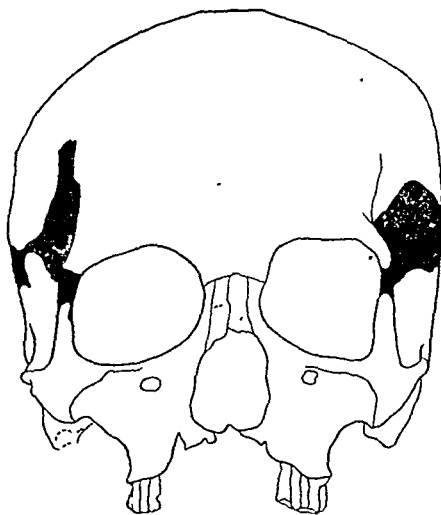


Fig. 9

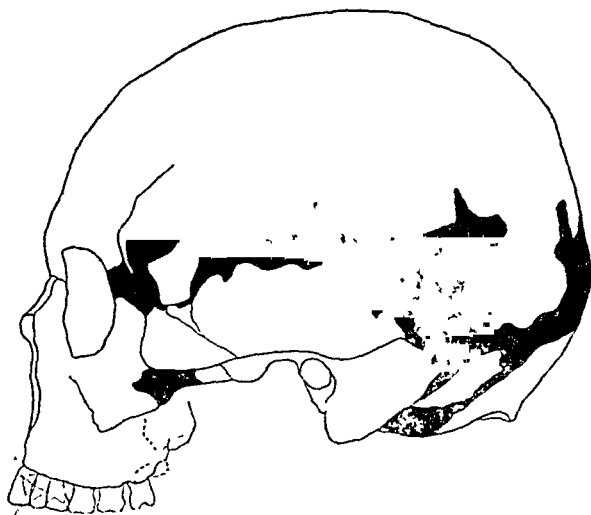


Fig. 10

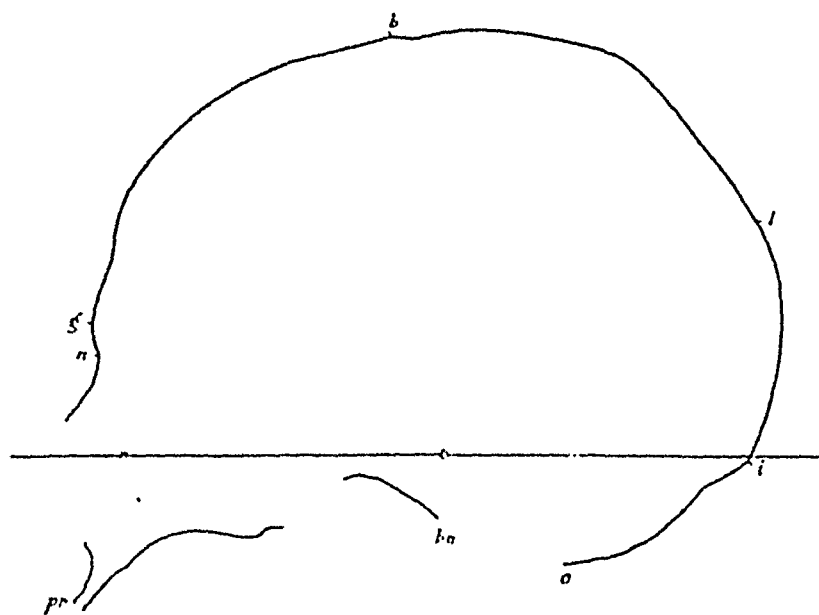


Fig. 11 Skl. H 780

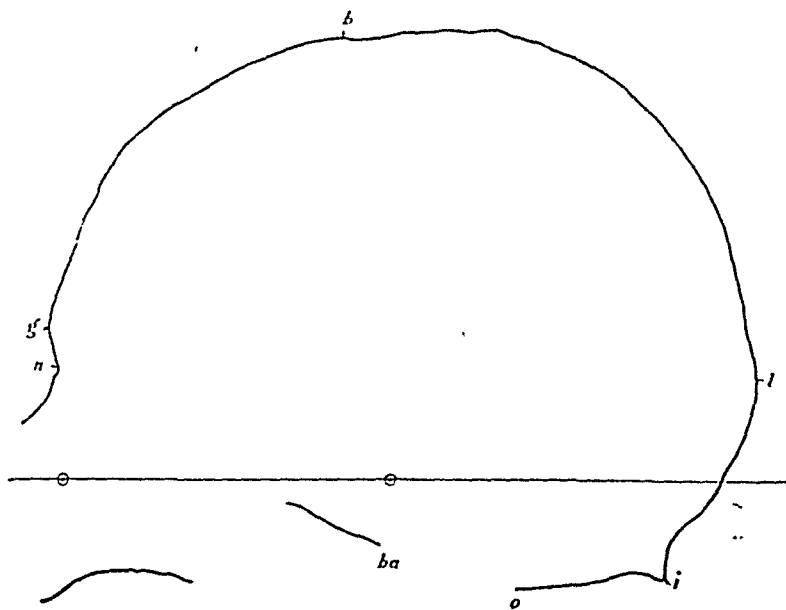


Fig. 12 Skl. H 793 (A)

exceeds all the other skulls in the whole of the Harappān series. The cubic capacity of the cranium is very large (1605.68 c.c.). The skull is incomplete; a considerable portion of the basis cranii and all the maxillary incisors and right canine are missing. The norma verticalis is wide ovoid with marked parietal eminences. The inion is very prominent and the muscle attachments in the occipital region are medium. The norma occipitalis is broad, house-shaped with a faintly convex roof. The glabella is prominent and depression at the nasal root is medium. In profile, the forehead ascends obliquely, passes back into a low arched vertex, while the occiput is only slightly convex with no actual protrusion. The skull is on the upper border of mesocrany (L-B Index 79.79), hypsicranic (L-AH Index 63.52) and tapeinocranic (B-AH Index 79.61). The superior facial index is 47.87? (euryprosop) and the nose is mesorrhine (NI 47.79).

Corpus mandibulae is in a fairly good state of preservation, whereas greater portion of both the ascending rami is not preserved. All the teeth have erupted but incisors lost *post mortem*. Teeth are all in much worn state. Chin is prominent, lying 5 mm in front of the lower alveolar point. The vertical depth of the horizontal ramus at the region of second molar is 30 mm.

SKL. 793 (B) [Fig. 13; Pls III, IV]

The skull is that of an adult male of about 30 years of age. Zygomatic arches, occipital condyles and styloid processes are broken and missing. Both the parietals are eroded. Supraorbital ridges are absent but the mastoids are strong, having moderate muscular impressions at the nuchal region. Vault sutures are open, but *synchondrosis sphenobasilaris* is ossified. Vertical contour is oval in shape which is narrow in front and slightly expanded at the parietals. Seen from the side, the forehead rises vertically and slopes back posteriorly and the occiput bulges well behind. The vertex is of medium height (vertical porion height being 116.0 mm) and is slightly flattened. The skull is dolichocranic (L-B Index 70.43), orthocranic (L-AH Index 62.37) and acrocranic (B-H Index 98.47). Nasal profile is concave and not sunken at the root. All the maxillary teeth have erupted but many of them have lost *post mortem*.

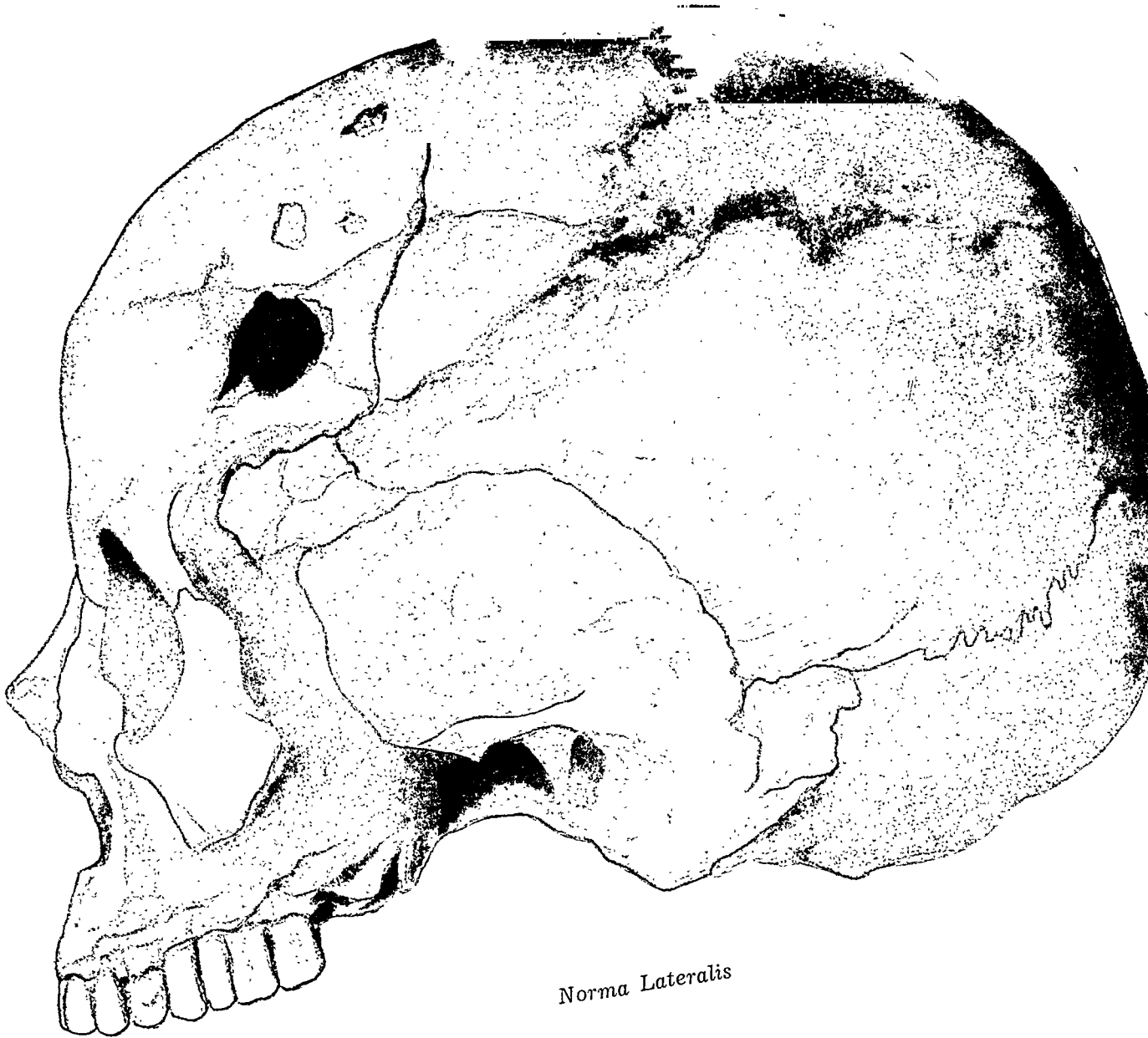
The lower jaw is incomplete. The left ascending ramus is broken off immediately behind M₃. All the teeth have erupted but incisors, right canine and right PM₁ are missing. Chin is only moderately developed and mylohyoid ridge is not very distinct.

SKL. H 794 [Fig. 14; Pls. V, VI, XX]

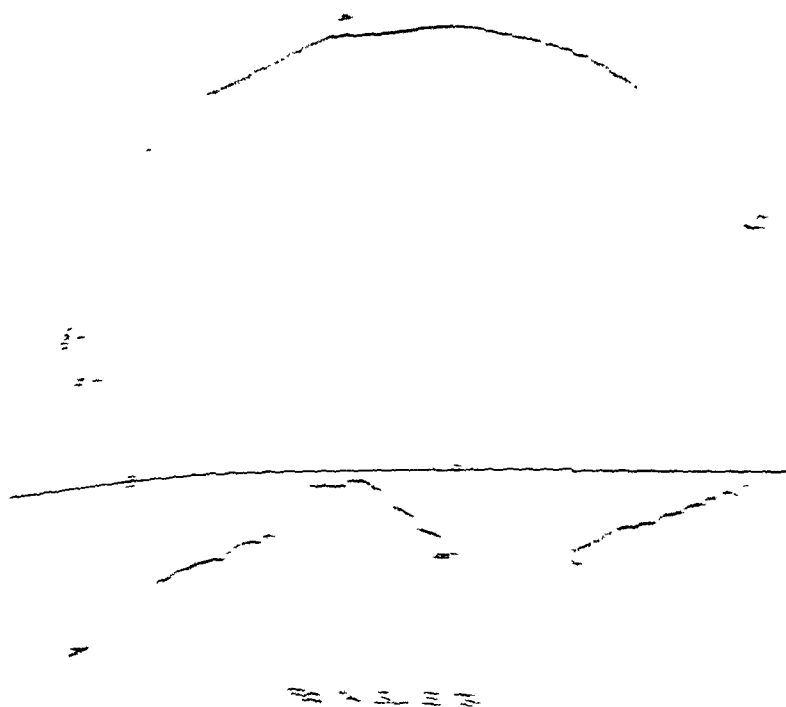
The skull belongs to an adult male of about 30 years of age. The general state of preservation of the skull is not very good. The ectocranial surface, particularly the left lateral side, is eroded and small portion of both the parietals are missing. The glabella is marked, superciliary arches well developed, and mastoids large. When viewed from the top, the skull is *byrsoides* in shape and the zygomatic arches are bowed out laterally from the vertical contour. In profile, the forehead is little inclined and the slope passes backwards into the occipital squama, which projects beyond the inion. There is also evidence of some degree of subnasal prognathism, and pre-auricular length of the skull is slightly greater than post-auricular length. The skull is dolichocranic (L-B Index 72.14) and orthocranic (L-AH Index 61.72). The nasion is depressed at the root and the nasal index lies on the border



Norma Frontalis



Norma Lateralis



between mesorrhine and chamaerrhine (NI 50.94). The calculated cranial capacity of the skull is 1481.60 c.c., i.e. aristencephal according to Sarasin's classification and megacephal according to Flower and Turner's classification.

The lower jaw is fragmentary in nature. All the teeth have erupted but the right lateral incisor is found to be missing from the socket. The crowns of the teeth have considerably worn down. The chin is well developed, lying 6 mm in front of the lower alveolar point, corpus massive and ramus broad. The depth of the symphysis is 40.0 mm and maximum breadth of the ascending ramus is 44.5 mm.

SKL. H 795/A

This is an adult skull probably of a female. The skull is in badly warped condition. All the sixteen maxillary teeth are intact and worn well through the dentine. Supraorbital ridges are not developed and the mastoids are medium in size. From the top of the skull contour is ovoid with some amount of bulging at the parietals. Forehead is receding and of medium breadth. The subnasal height is medium with some amount of prognathism. The skull is long and the vault of the skull is low. The orbits are rounded and hypsiconchic (right OI 89.47 and left OI 93.24). The nasal aperture is narrow, moderately high and mesorrhine (NI 48.42); and the inferior border of the pyriform aperture is *oxykraspedotic*. The palate is long, narrowed in front and parabolic in shape.

Mandible had to be restored to a considerable extent before measurement. The jaw is of moderate size and the muscles of mastication are not well developed. Chin is prominent but corpus is moderate in bulk. Surface of molar teeth shows considerable attrition. The mandibular measurements* are as follows:

Ht. of mandibular ramus	60.0 mm.
Ht. at mandibular symphysis	27.0 mm.
Mandibular length	77.0 mm.
Max. breadth of mandibular ramus	43.0 ? mm.
Min. breadth of mandibular ramus	31.0 mm.
Mandibular angle	126°

SKL. H 796 (B) [Fig. 18: Pls. VII, VIII]

It is a complete locked-jaw skull belonging to that of an adult male between 25 and 30 years of age. The skull is warped and both the malar bones have eroded considerably. Right zygomatic arch and styloid processes are missing. All the sixteen pairs of maxillary and mandibular teeth are intact and well set in position in clenched condition, excepting the upper right central incisor. Almost all the teeth exhibit vertical cracks. Basilar suture is united while the coronal, sagittal and lambdoidal sutures are open. The supraorbital crests tend to be well developed with sharp muscular attachments. Other indications of muscularity are strong temporal lines. The skull is sub meso-cranic (L-B Index 75.84), hypsicranic (L-AH Index 64.04) and metriocranic (B-AH Index 84.44). The

* Detailed measurements are presented here since the specimen was not correctly mended when the Collective Tables were sent to press.

orbits are hypsiconchic (right OI 92.31 and left OI 95.00). The nose is chamaerrhine (NI 52.34) and the face is long oval. The intracranial capacity is 1336.67 c.c.

SKL. H 798 (A) [Figs. 15, 16, 17]

The skull is that of an adult male. It is complete except a gap in front of the coronal suture on the left frontal bone. Supraorbital ridges are very highly developed and the muscular impressions at the nuchal region are remarkably prominent forming an occipital torus. Left mastoid is strong and big, right is missing and the nasion is sunken. Forehead is receding and the sagittal contour is not so well arched and the occiput while fairly prominent, retreats sharply downwards and forwards. Face is medium in height and moderately broad, the upper facial index being on the border line of lepten—mesen (lepten 55.60). The palate is narrow and *upsiloid* in shape. All the

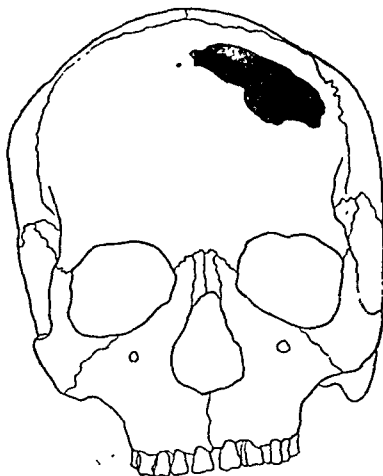


Fig. 15

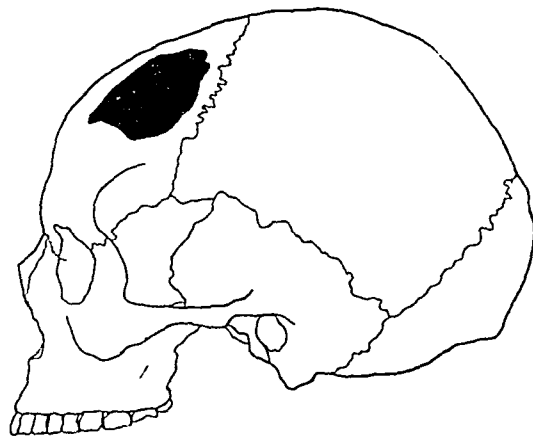


Fig. 16

maxillary teeth have erupted and are intact excepting the left M_3 ; the cusps show considerable wearing. The degree of wear of incisors definitely suggests an 'edge-to-edge' bite. There appears to have some degree of lambdoid flattening, probably due to the presence of occipital 'bun'. When seen from above the skull is *byrsoides* in outline and expanded at the parietals. Orbits are low and rectangular, inclined laterally downwards and are both chamaeconchic (OI 73.49). The nasal aperture is wide and short, and consequently chamaerrhine in nose form (NI 53.00). The margo pyriformis apertura is *amblykraspedotic*. Subnasal prognathism is evident. Palate is *paraboloid* in shape, deep and somewhat narrow anteriorly. The skull is hyperdolichocranic (L-B Index 69.31) and orthocranic (L-AH Index 59.79). The cranial capacity of the skull is 1357.20 c.c.

SKL. H 798 (a) [Fig. 21; Pls. IX, X]

Probably female skull between 30 and 40 years of age; sutures are unobliterated and teeth are all in a very much worn state. There is no lower jaw. The mastoid processes, muscular attachments and temporal curved lines are moderate. The vault of the skull is moderately low as shown by the



Fig. 17 Skl. H 798 (A)

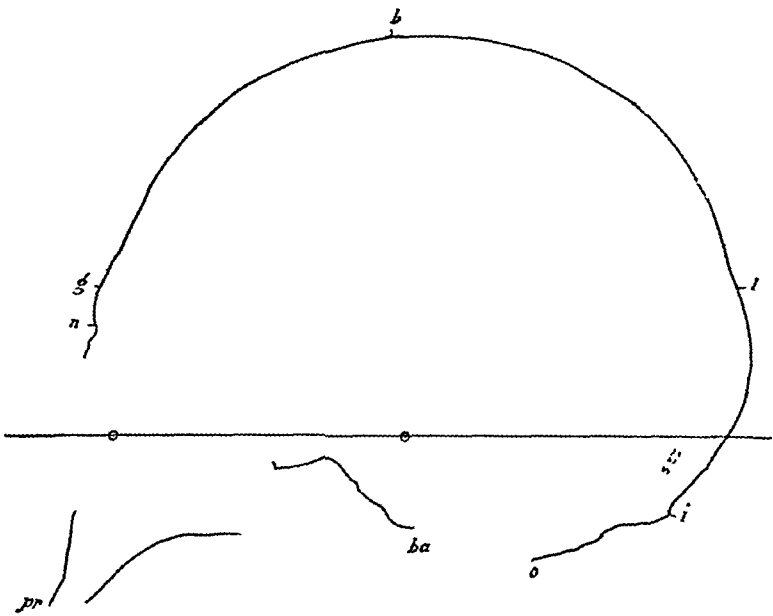


Fig. 18 Skl. H 796 (B)

MID-SAGITTAL CURVE (1/2 NATURAL SIZE)

vertical porion height (111.5 mm). The orbits are low, rectangular and inclined laterally and downwards and the maxillo-frontal orbital index lies marginal to the middle class (OI 76.83 both). The skull is dolichocranic (L-B Index 72.47) and orthocranic (L-AH Index 62.64) and very near to acrocrany (B-AH Index 86.43). Outline of the norma verticalis is *ovoides*. The calculated cubic capacity of the skull is 1254.88 c.c. or distinctly euencephalic.

The glabella and supraorbital ridges are prominent and from the side, the forehead appears to be slightly receding. The sagittal contour is not so well arched and the occiput is rounded with a house-shaped outline of norma occipitalis. The nasion is moderately depressed at the root, having broad constricted nasal bone with concave bridge. The upper face (nasion-prosthion) is 66.0 mm long, bizygomatic width 127 mm, and there is also some amount of subnasal prognathism. The dental arcade is *upsiloid*, the palate being short and broad.

SKL. H 798/A 1 [Figs. 19, 20, 22]

The skull is typically female ; small, smooth, gracile with weak supraorbital ridges and muscular impressions are feminine features. It is complete and in an excellent state of preservation and approximately 30 years of age. When seen from above the skull is *sphenoides* in outline and *phaenozygous*. Forehead rises vertically and then sweeps back in a regular curve to meet the rounded occiput. The orbits are large and squarish. The skull is brachyranic (L-B Index 80.70) which is nearer to upper margin of mesocranic class and hypsicranic (L-AH Index 64.91). The nasion is only slightly depressed, with a concave bridge formed by wing-shaped nasal bones. The inferior border of the nasal aperture is *oxykraspedotic*. Dental arch is *upsiloid* in shape. There are thirteen teeth in the sockets of the maxillae, the crowns of which are deeply worn. The upper wisdom teeth are not erupted and right M_1 lost *ante mortem*.

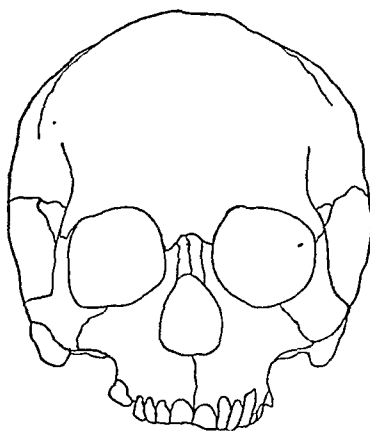


Fig. 19

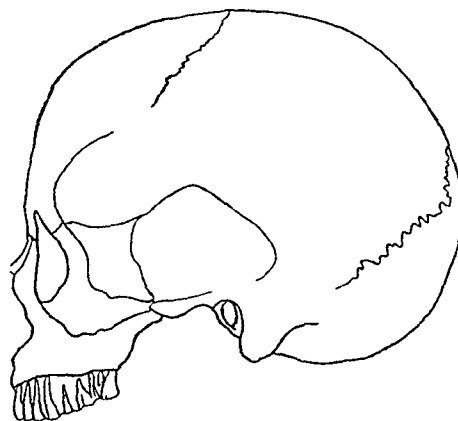


Fig. 20

SKL. H 798 (B)

The skull is incomplete. Mandible, right half of the facial region, right os *temporale* and whole of the basilar part is missing. The sex appears to be that of a male ; the prominent supraorbital

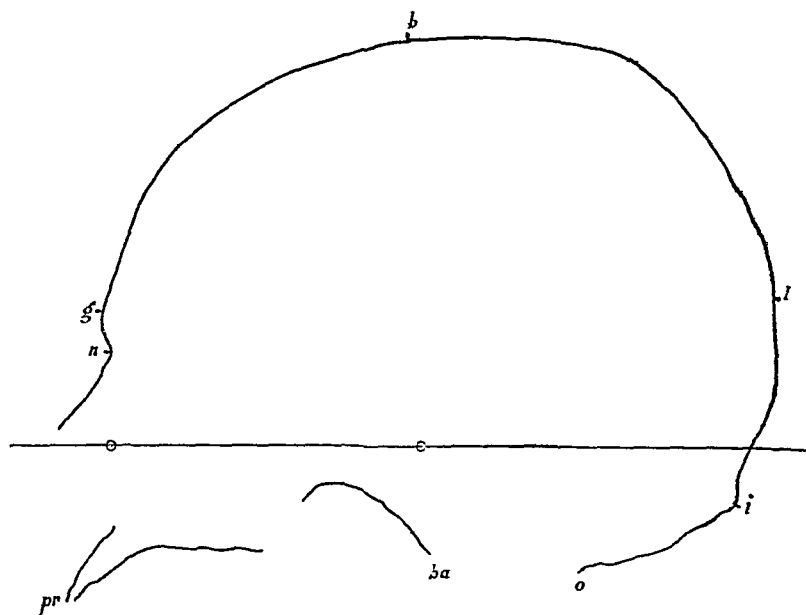


Fig. 21 SKL. H 798 (a)

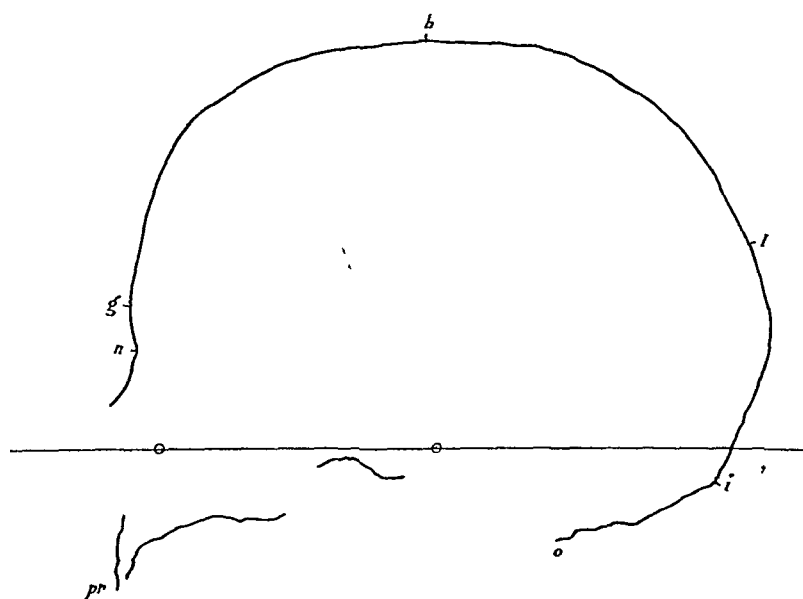


Fig. 22 SKL 798/A 1

MID-SAGITTAL CURVE (1/2 NATURAL SIZE)

ridges, large left mastoid process and thick bones are masculine features. The age is definitely of the adult class, part of sagittal suture is ossified ; the coronal suture is, however, open. *Norma verticalis* is rather ovoid in shape. In *norma lateralis* the forehead is low but retreating and the vertex is somewhat flat. The glabella is moderately prominent and nasion depressed at the root. The left orbit is somewhat rectangular in shape and mesoconchal in form, the right orbit is missing.

SKL. H 798 (C)

The skull is distorted and a large part is missing. The missing parts include whole of the frontal region with zygomatic arches and sphenoidal part of the basis cranii. The sex is undoubtedly male, having thick bones, prominent supraorbital ridges, well-developed muscular attachments and big mastoids. When seen from the top, the skull appears to be *byrsoides* in outline. The frontal bone is evenly sloping and passes back to the slightly domed vertex. The occiput is protruding with a moderately pronounced *tuber occipitale*. The occipital contour is house-shaped. The skull is hyperdolichocranic (L-B Index 69.68 ?), orthocranic (L-H Index 72.87) and acrocranic (B-H Index 104.58).

SKL. H 801/A [Fig. 23; Pl. XXVIII : 1-2]

The skull is complete and in a fairly good state of preservation. The ectocranium is granular and pitted. The sex is undoubtedly female. It is gracile, smooth contoured, having ill-developed supraorbital ridges and muscular impressions with small mastoids. Supraorbital notches are present on both sides of the sharp margin. There is a trace of persisting frontal suture. Basilar suture is closed. The skull is dolichocranic (L-B Index 71.47) and hypsocranic (L-AH Index 64.67). The forehead is high and nearly vertical to about ophryon where it commences gradually to slope backwards ; occiput being moderately protruding. When viewed from above, the skull is *elliptical* in outline. Parietal eminences are somewhat prominent. The orbits tend to be rectangular, both being hypsiconchic (right OI 86.84, left OI 87.18). Nose is prominent and leptorrhine (NI 45.28), having narrow constricted nasal bones. Nasal profile is only slightly concave with no depression at the root. The face is long and narrow. Alveolar margin is absorbed.

The mandible is moderate in size. The bicondylar breadth is 117.0 mm and the minimum breadth of the ramus shows a medium value (36.0 mm). The mandibular teeth are very badly worn (dentine exposed on cusps). Chin juts out anteriorly.

SKL H 804

The skull is incomplete being that of an adult female. It is survived by only the anterior third with right temporal, mastoid processes and mandible. All the teeth of right maxilla, excepting the molars which were fallen out *post mortem* are intact ; at left, excepting the left lateral incisor, PM₁, PM₂ and others are all in their position. Teeth show marked attrition (in case of incisors lingual attrition) and widening up of space between roots, particularly in the mandible. The supraorbital ridges are not developed and the mastoids are small. The forehead is nearly vertical and the frontal eminences are prominent. The orbits are somewhat squarish, both being hypsiconchic (right OI 87.50

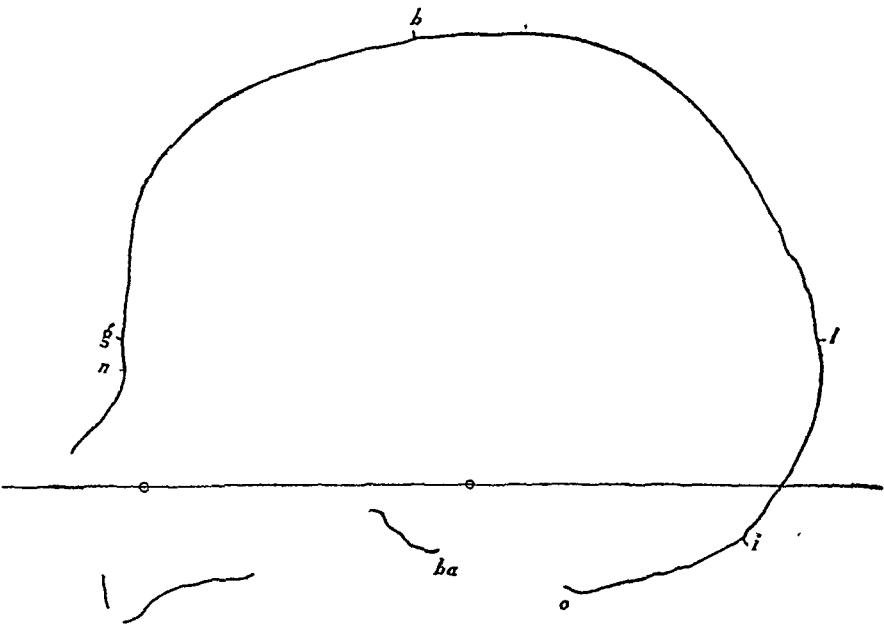


Fig. 23 SKL. H 801/A

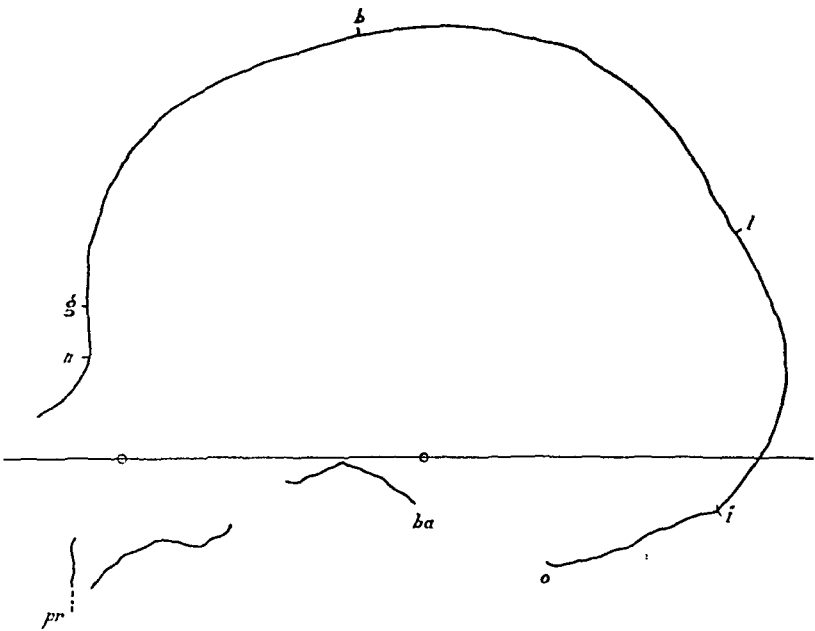
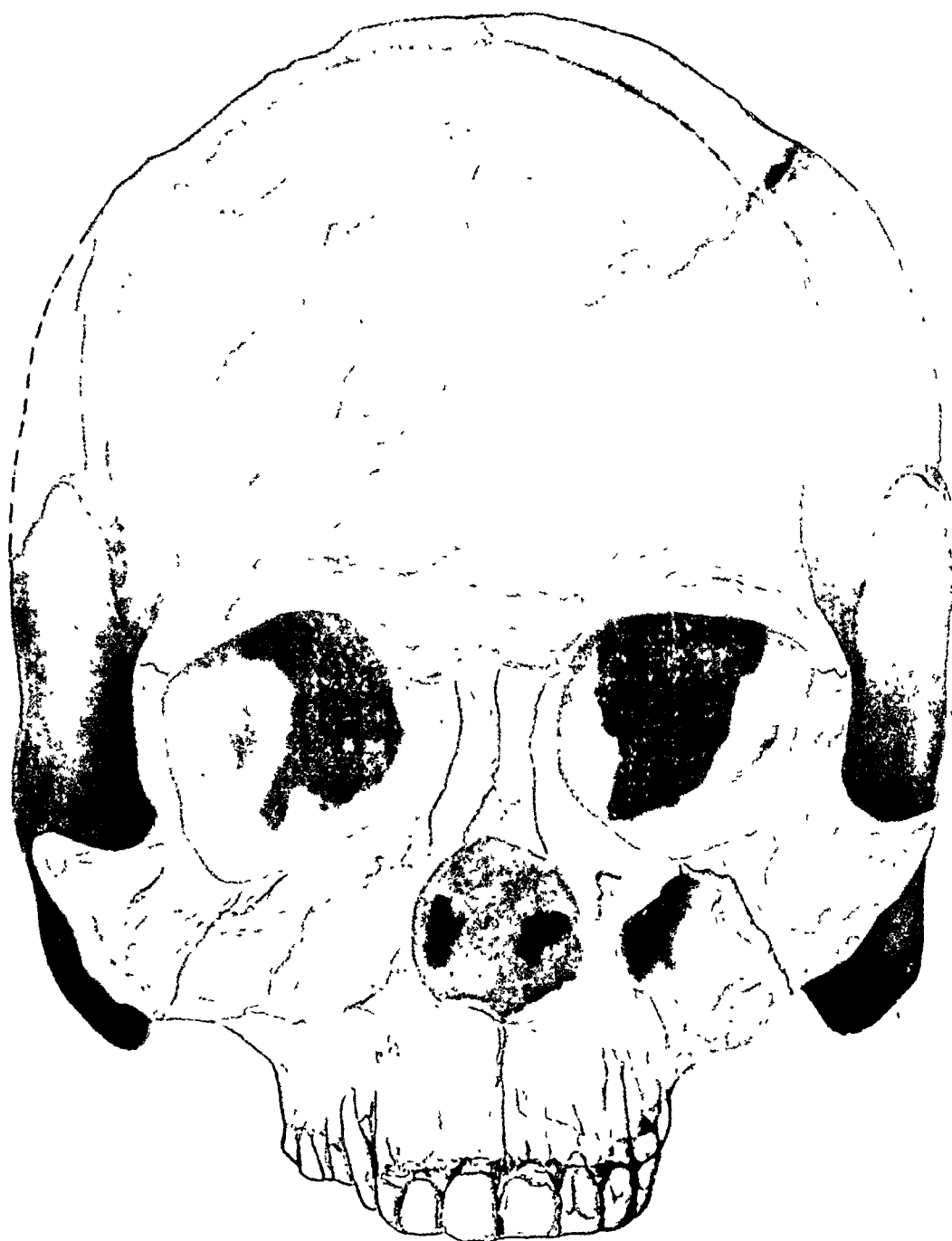
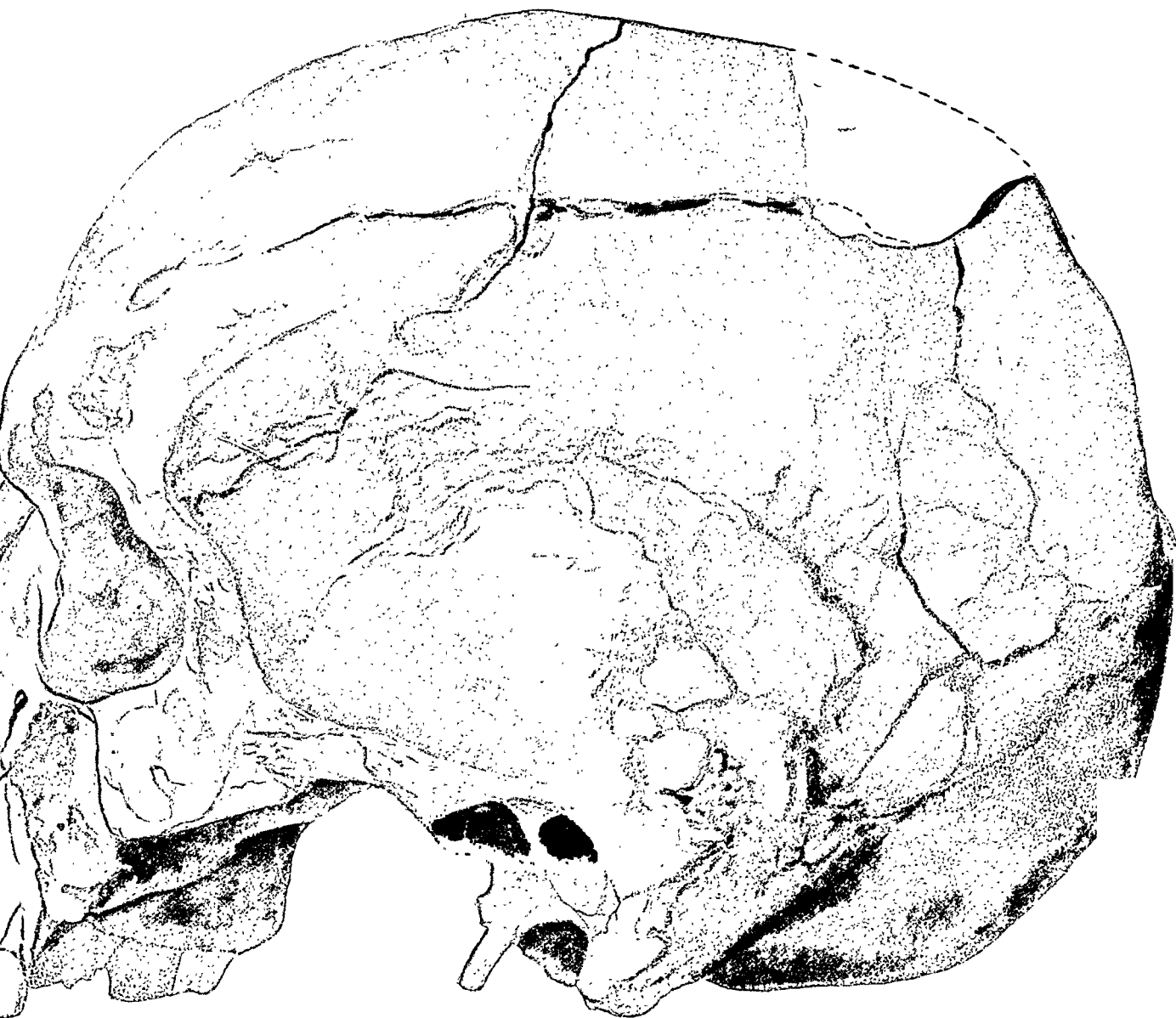


Fig. 24 SKL. H 805



Norma Frontalis

DIOPTOGRAPH TRACING (WASH) : MALE SKL. H 794 (Natural Size)



Norma Lateralis

DIOPTOGRAPH TRACING (WASH) : MALE SKL. H 794 (Natural Size)

and left OI 89.47). The superior orbital foramen is present at the right, while at the left there is a supraorbital notch. The nose is mesorrhine (NI 48.91).

Mandible is complete, though several teeth had been lost during life, and sockets are absorbed. Mandibular teeth are also in much worn state, particularly molars are hollowed by wear. The chin is not prominent to a marked degree and depth of the symphysis is only 24.0 mm. The minimum breadth of the ascending ramus is moderate (30.0 mm).

SKL. H 805 [Pl. 21; P. XXI]

The skull appears to belong to an adult female fairly old in age. Most of the vault sutures being ossified and molars show considerable wearing. Outer wall of the right orbit, right malar bone and right maxilla are missing. The skull is gracile and smooth contoured, having weak muscular impressions with no supraorbital ridges. Forehead is narrow; it rises vertically and sweeps back in an even curve. The skull is long, narrow with laterally compressed wall-like sides. The skull is markedly dolichocephalic (L-B Index 70.76), orthocephalic (L-Alt Index 62.73) and acrocephalic (B-Alt Index 88.64). Nasal aperture is moderately short and broad, chamaerhine (NI 52.94); nasal profile is concave without any depression at the root. The left orbit is hypsiconic (OI 86.36).

When seen from above, the skull is ellipsoidal in contour and cryptozygous. The occiput is moderately protruding and the occipital contour is house-shaped; subnasal prognathism is absent. All the maxillary teeth are missing. Mandible is fragmentary in nature and no useful measurements could be taken.

SKL. H 806 [Pl. 25, 26, 27; Pp. XXII, XXIII, 244]

The skull is well preserved and belongs to that of an adult male. Most of the sagittal suture and greater part of the lambdoidal suture being ossified. Supraorbital ridges and mastoids are well developed. Oblique cut mark presents at the vertex. In *norma verticalis*, the outline of the skull is ellipsoidal. When seen from side, the forehead is receding and passes back posteriorly. Slight degree of flattening is seen at the bregmatic region and the occiput is markedly *en chignon*. The face is

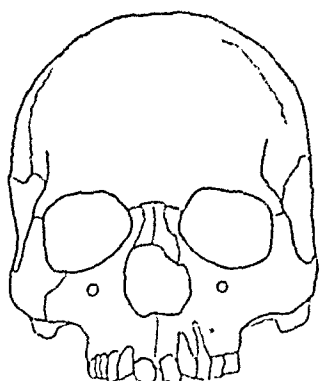


Fig. 25

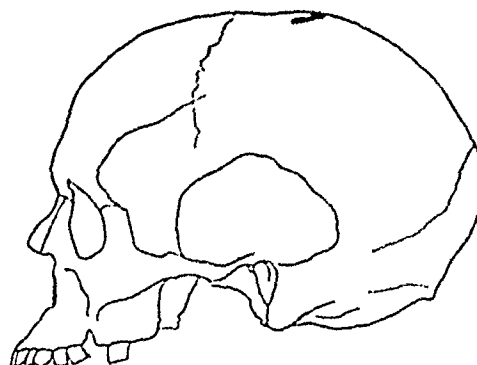


Fig. 26

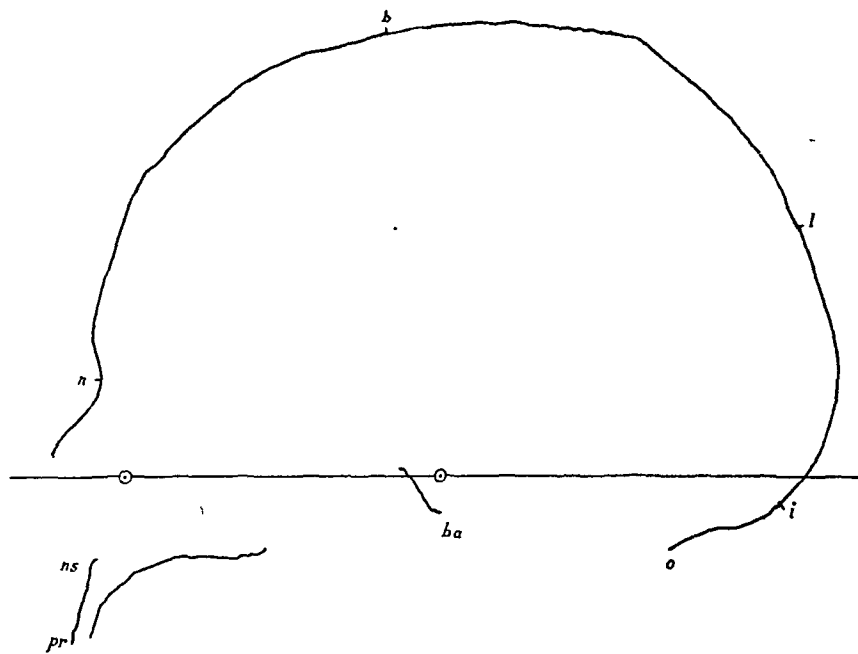


Fig. 28 SKL. H 806/A

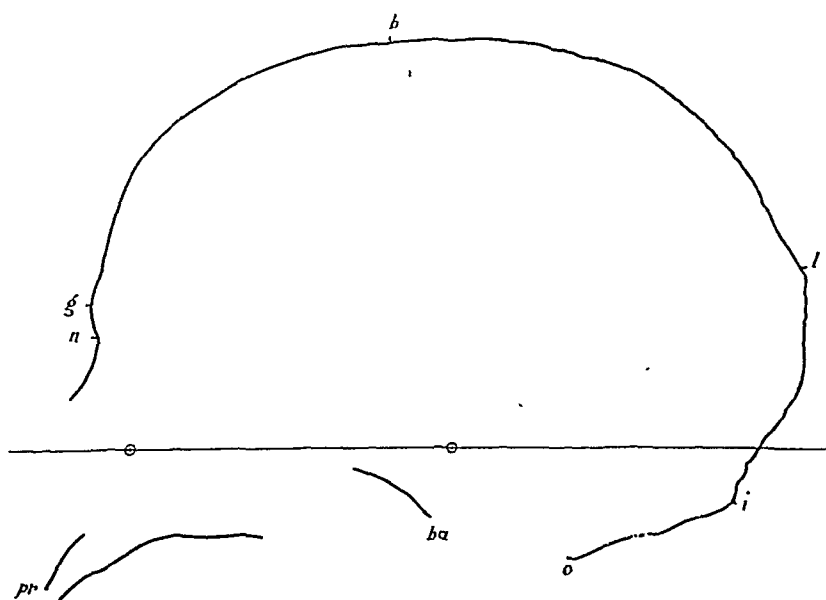


Fig. 27 SKL. H 806

MID-SAGITTAL CURVE ($\frac{1}{2}$ NATURAL SIZE)

moderately high and moderately wide, superior facial index being 52.06 (mesen) with flattened temples while the total face is middle and mesoeuryprosop (88.76). The skull is hyperdolichocranic (L-Index 69.31), and on the border between orthocranic and chamaecranic (L-AH Index orthocranic 58.4). The nose is broad and relatively short, being chamaerrhine (NI 56.60). Nasal profile is concave and the nose is sunken at the root. The skull shows a considerable degree of alveolar prognathism, with the upper incisors projecting forwards. The palate is *parabolic* and the teeth are somewhat worn down.

The lower jaw is well formed with prominent and slightly everted chin. The corpus is massive and ramus broad, the minimum breadth of the ramus being 36.0 mm.

SKL. H 806/A [Figs. 28, 29, 30: Pl. XXIII]

The skull is in a very good state of preservation. The sex is difficult to determine with certainty; smooth contour, small mastoids and weak muscular impressions rather suggest a female. The vertical contour is *pentagonoid* in shape, narrow in front and bulging at the parietals. From the side the forehead is slightly receding and slopes back posteriorly with a slight flattening in the bregma

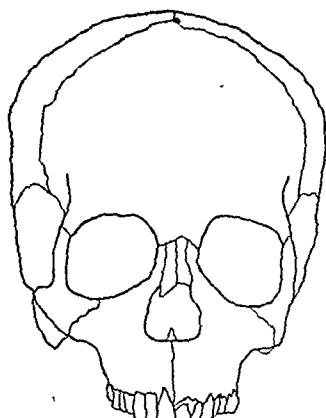


Fig. 29

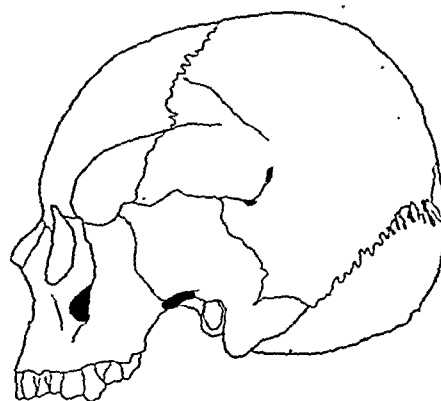


Fig. 30

region. The occiput is moderately protruding and from the superior nuchal line it projects forward sharply. The skull is dolichocranic (L-B Index 71.28) and acrocranic (B-AH Index 86.33). The nasal aperture is short and broad, hence chamerrhine (NI 53.19). The subnasal space is high with marked prognathism. The palate is long and narrow and *parabolic* in shape. All the teeth have cut and the cusps show appreciable wearing. Mandible is well preserved, having prominent and slightly everted chin. Corpus is massive, the symphyseal height being 35.0 mm. The mandibular teeth are badly worn with signs of caries. The degree of wear of the incisors definitely suggests that the teeth during life time met in an edge to edge bite (pl. XI : 1).

SKL. H 811 [Pl. 31: Pl. XXIV: 1-3]

The skull is nearly complete. The left lateral view

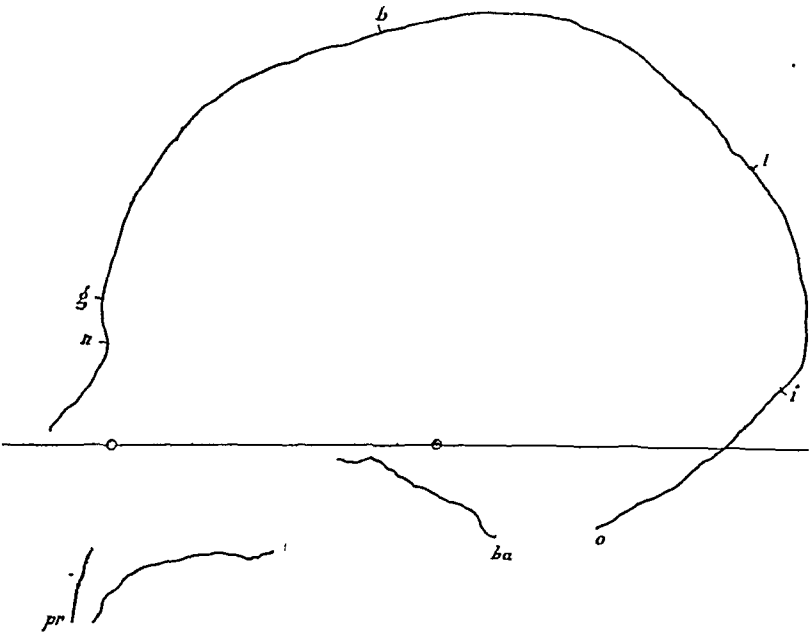


Fig. 31 SKL H 811

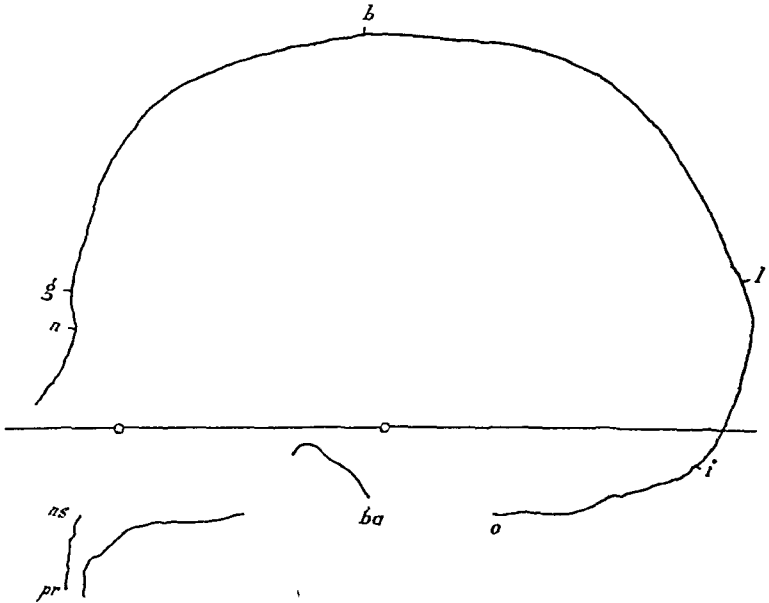
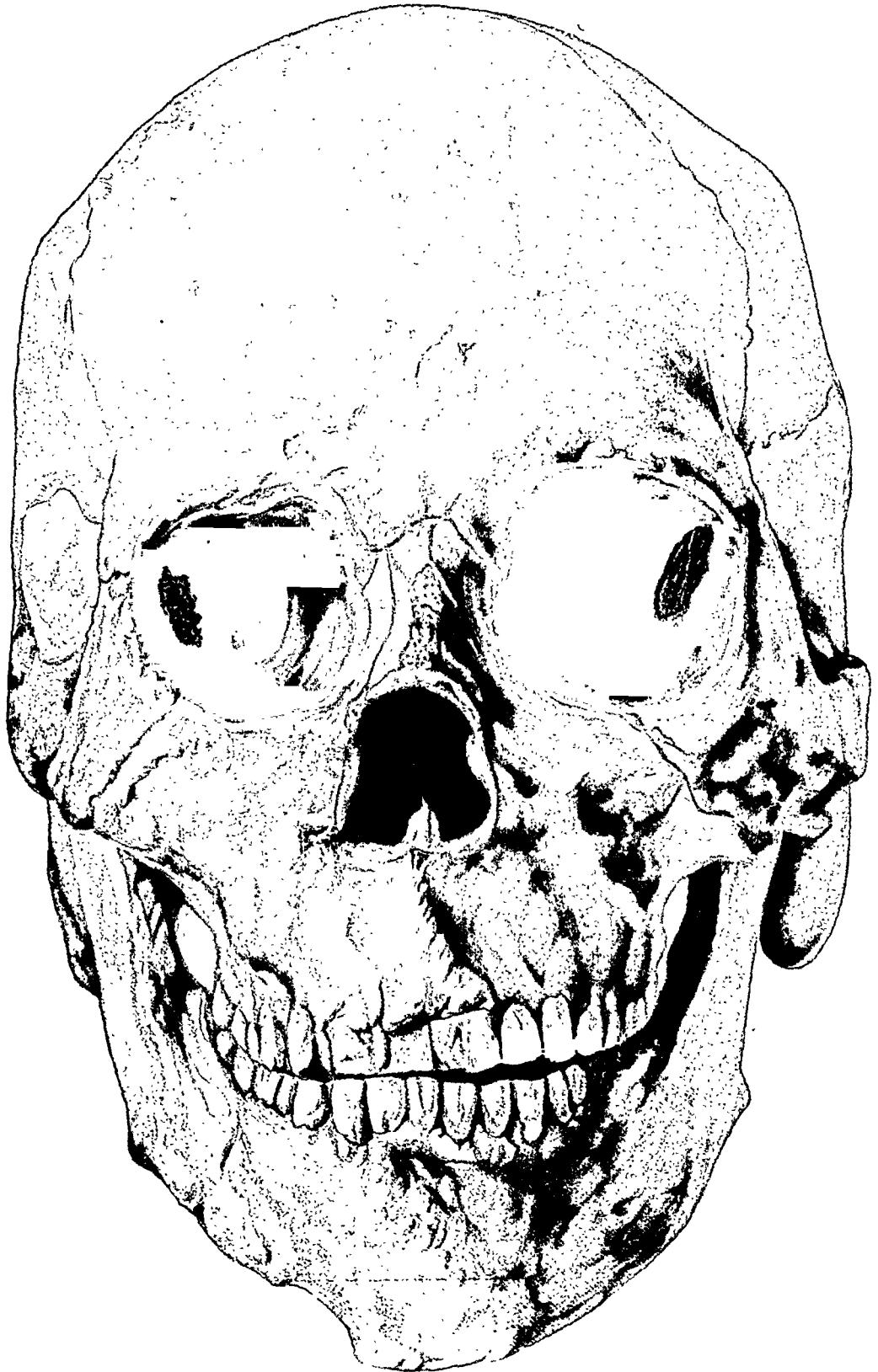
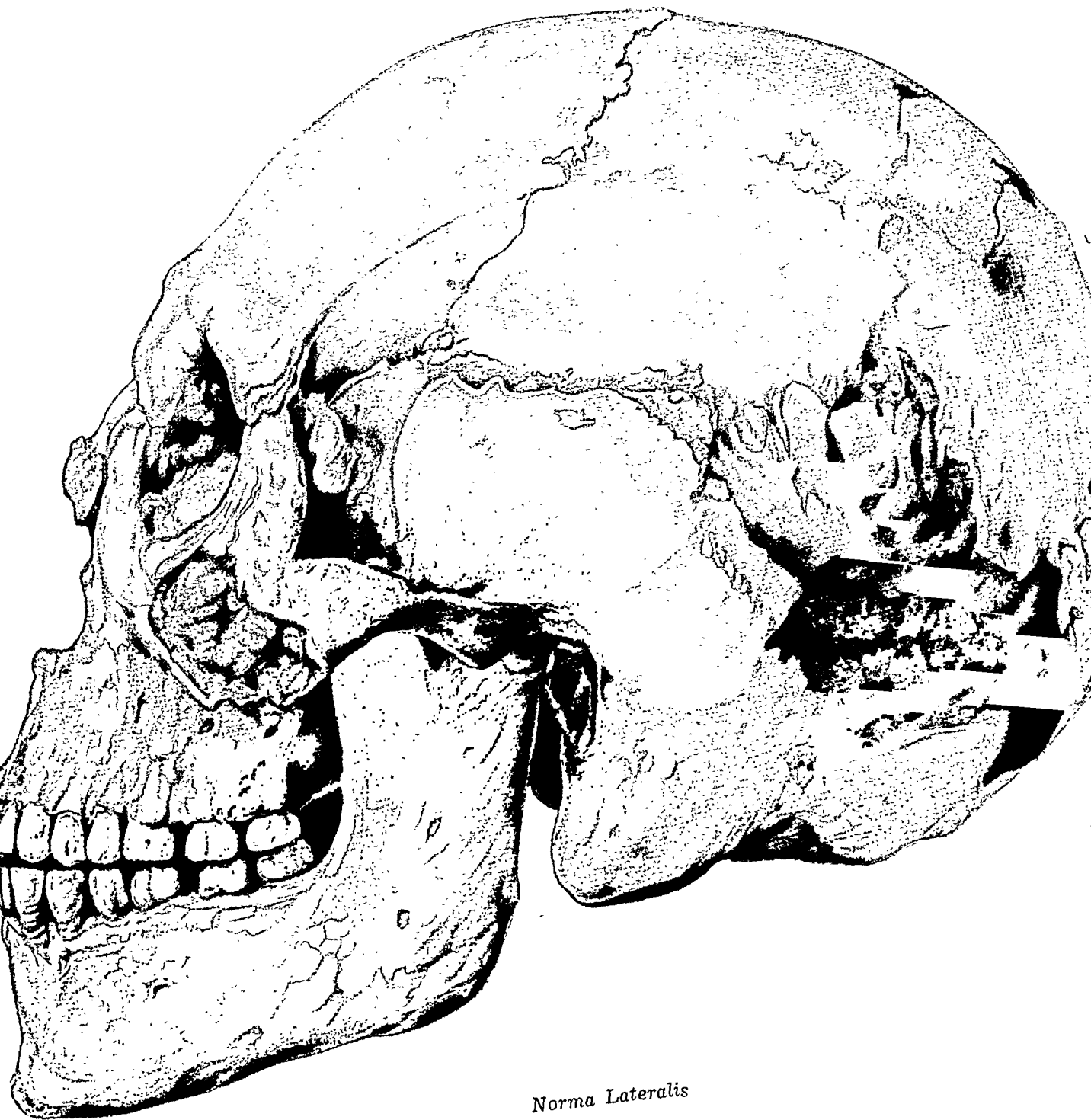


Fig. 32 SKL. H 812

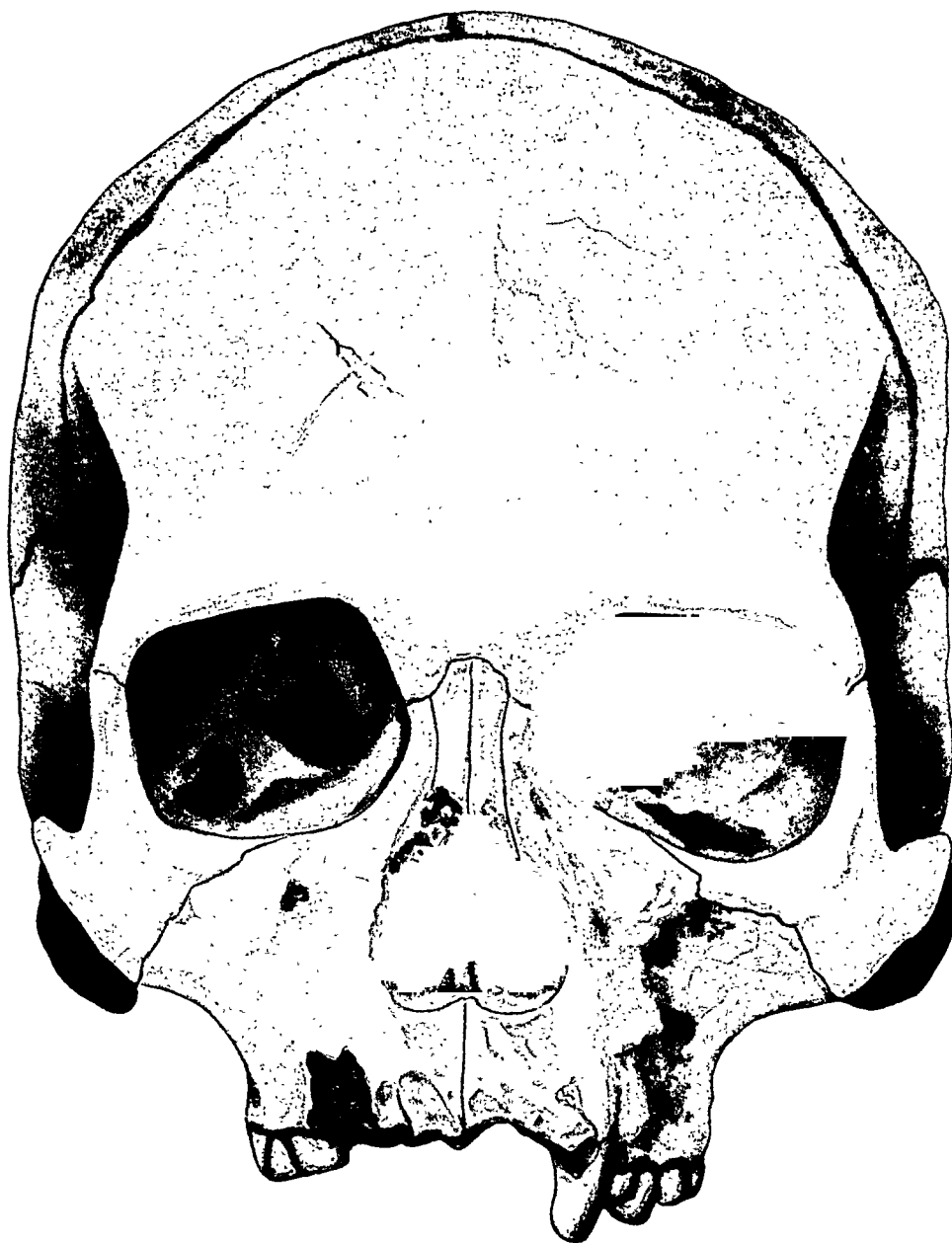
MID-SAGITTAL CURVE (1/2 NATURAL SIZE)



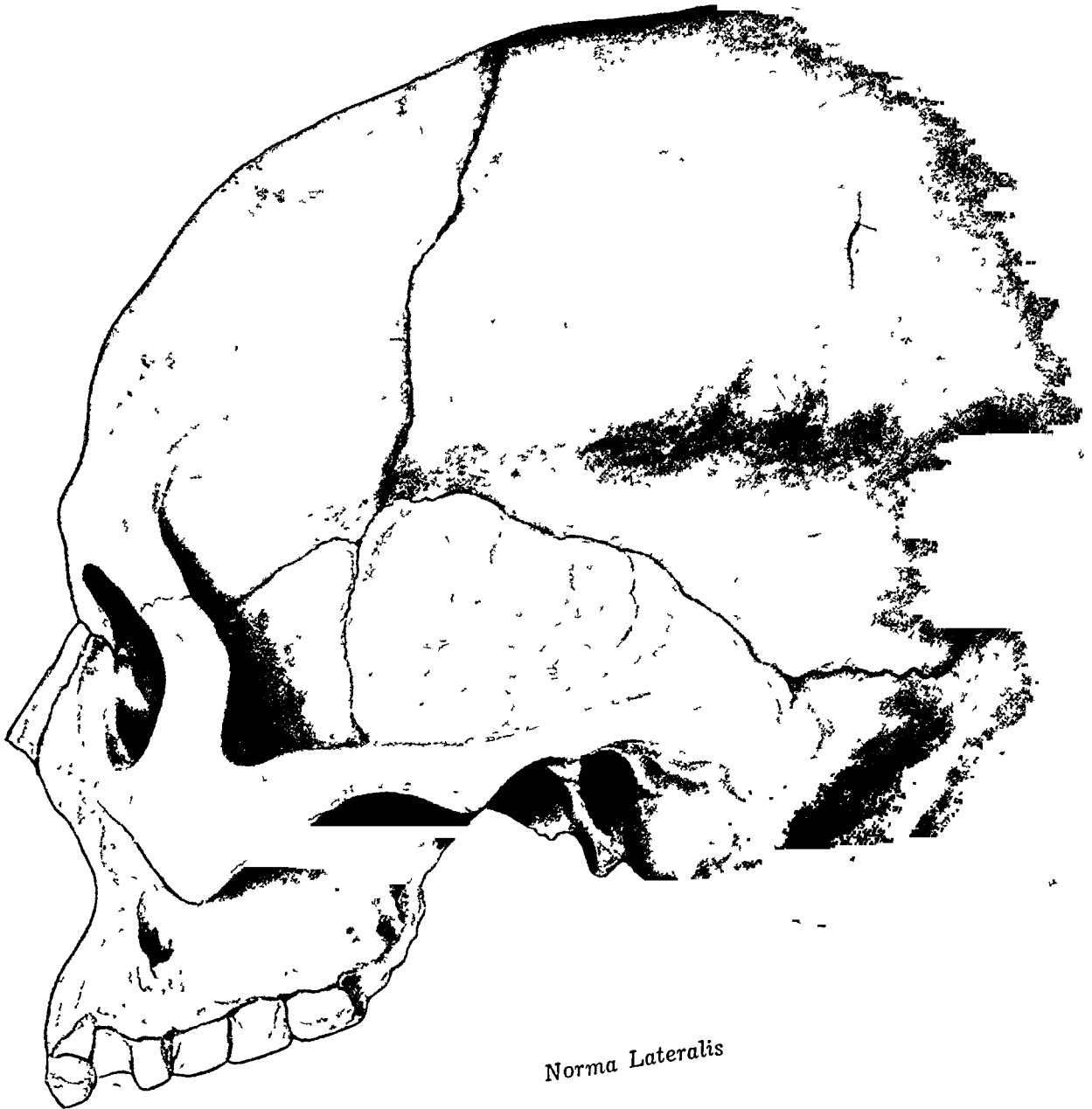
Norma Frontalis



Norma Lateralis



Norma Frontalis



Norma Lateralis

to be an adult male. The contour of the norma verticalis is somewhat *ellipsoides*. In norma temporalis supraorbital ridges are slight, the frontal bone slightly inclined and ascends into a smooth curve upto the bregma. The vertex is flat and the occipital area is abruptly sloping with a *chignon*. The nose is moderately prominent (NI 49.15 ?), bridge concave and nasion only slightly depressed. The skull is dolichoecranic (L-B Index 71.74 ?), hypsiceranic (L-AH Index 64.67) and acroecranic (B-AH Index 90.15 ?). The calculated cranial capacity is 1389.77 ? c.c., i.e. euencephalic. Only the right orbit, which could be measured, is squarish in form and mesoconchic (OI 80.00). The length of the upper face (nasion-prosthion) is 74.0 mm.

SKL. H 812 [Fig. 32]

The skull is not well preserved. Right lateral side and facial region have undergone considerable degree of warping. The skull is typically female. Gracile, smooth contour, ill-marked supraorbital ridges and small mastoids are all feminine features. The head shape, seen from above, is elliptical. Seen from the side, the forehead is slightly receding; it slopes back posteriorly and the occiput is well protruded behind. The roof of the skull is relatively low; the vertical perion height being only 109 mm. The skull is hyperdolichoecranic (L-B Index 68.68 ?) and orthoecranic (L-AH Index 59.89). The nasal index is leptorrhine (NI 43.40) and the nasal depression is medium with a concave nasal bridge. The orbits are large and tend to be squarish and are mesoconchic (right OI 84.78, left OI 82.95). The calculated cranial capacity of the skull is 1221.39 ? c.c., thus places it in the euencephalic class.

SKL. H 816 [Figs. 33, 34, 35, Pl. XXV]

The skull is that of an adult female approximately 30 years of age. Relatively small-sized skull, gracile and smooth contoured, with small mastoids but medium supraorbital development. The face is broad in relation to its height. Spheno-basilaris is closed while coronal and sagittal sutures have just started ossifying. There is a large elliptical gap on the posterior part of the left parietal. The skull is mesoecranic (L-B Index 77.84) and hypsiceranic (L-AH Index 65.27).

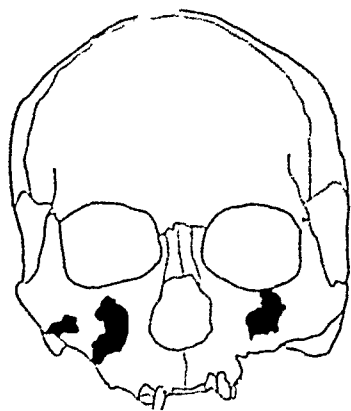


Fig. 33

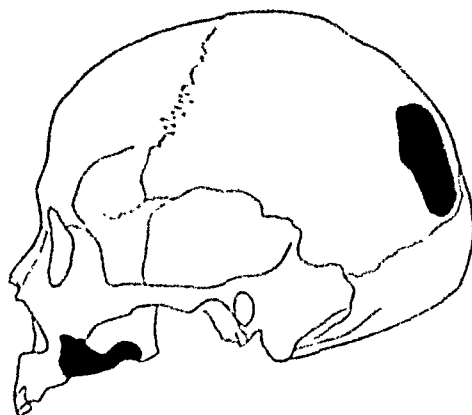


Fig. 34

Seen from above, the skull is *byrsoides* in outline, being expanded at the parietals; and is *phaenozygous*. The forehead is slightly receding, and slopes back posteriorly and merges with the rounded occiput which sharply retreats from the superior nuchal line. Orbits are relatively low

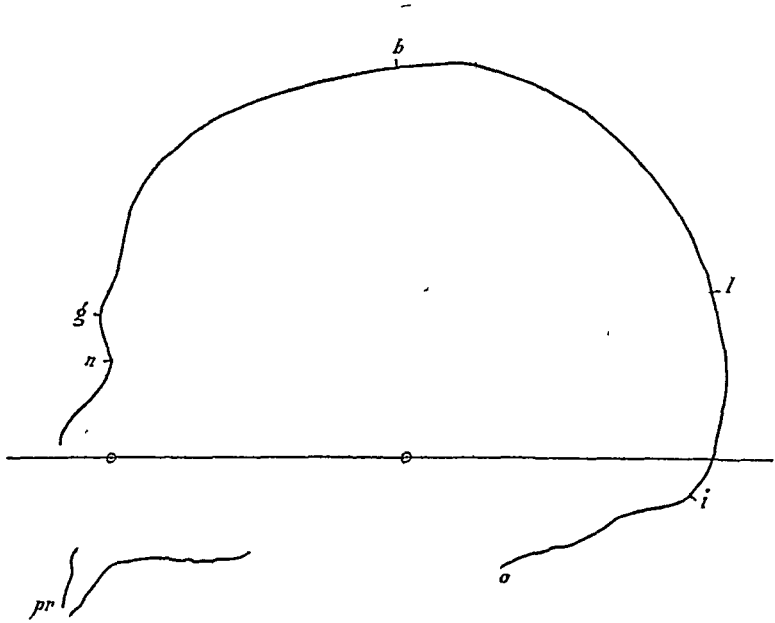


Fig. 35 SKL. H 816

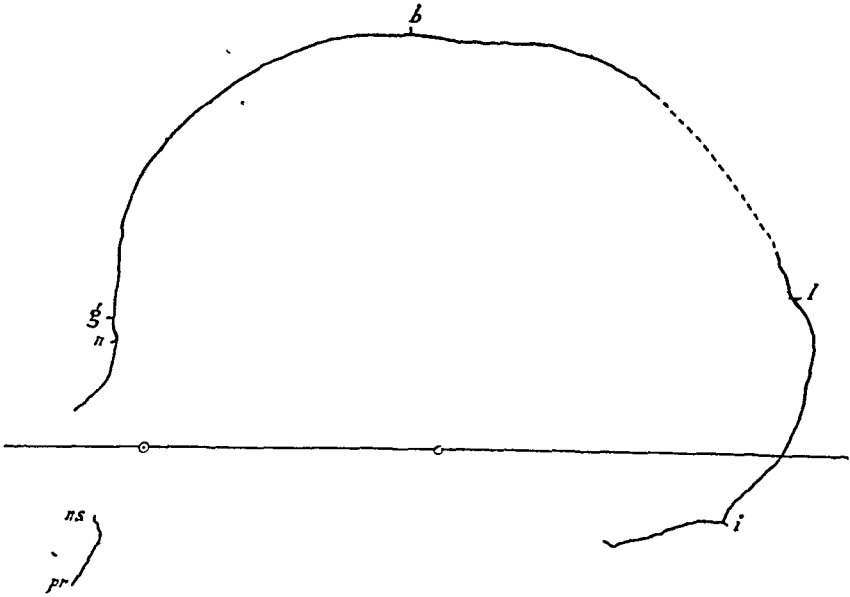


Fig. 36 SKL. H 818

MID-SAGITTAL CURVE (1/2 NATURAL SIZE)

and broad and fall in the mesoconchic class (right OI 82.05 and left OI 76.83). The face is moderately high and moderately wide (the superior facial index 50.78) with a moderate subnasal prognathism. The nasal aperture is wide and low resulting in a chamaerrhine nose (NI 52.58). Nasal bridge is slightly concave and nasion depression is medium.

SKL. H 817

The skull is gracile belonging to a young adult female of about 20 years of age. Almost the whole of the occipital, basicranii and some portion of right parietal are missing. The skull possesses a complete set of maxillary teeth nicely preserved without any wearing of cusps. The third molars did not cut. All sutures are open. From the top, the skull is *byrsoides*, with some bulging at the parietal eminences, and it is dolichoid. Supraorbital ridges are absent and the nasion is without any depression. The forehead is slightly receding and its breadth is medium. The face is moderately low and of medium breadth, superior facial index being euryn (49.59 ?) with slight degree of subnasal prognathism. The nose is of medium breadth and height, index being mesorrhine (NI 50.52) and the pyriform aperture is *oxykraspedotic*. The palate is broad, shallow and *parabolic*.

Mandible is fragmentary in nature and no useful measurements could be taken.

SKL. H 818 [Fig. 36; Pl. XXIV . 4-6]

The skull belongs to that of an adult male about 25 years of age. The skull is broken and without the lower jaw. Missing parts include, part of the right frontal bone, portion of right parietal, left mastoid process and part of the basis cranii. The vault sutures are simple and show sign of commencing ossification. Supraorbital ridges are feeble, right mastoid process large and nuchal impressions in the occipital bone are well marked. The forehead is slightly inclined; the cranial vault is fairly arched in the fronto-parietal region and slopes backwards and downwards in the parieto-occipital region. The occiput is prominent and projectes behind the inion. The skull is hyperdolichocranic (L-B index 69.15) hypsicranic (L-AH index 62.23) and acrocranic (B-AH Index 90.00). The nose is chamaerrhine (NI 52.08). The nasion is not depressed and the bridge is concave. There are fourteen teeth in the upper jaw. The teeth are all sound and there is no evidence of dental caries. All the teeth (with the exception of 2nd molars) are very much worn and the dentine freely exposed.

SKL. H 820 (I) [Figs. 37, 38, 39]

The skull belongs to an adult female of about 45 years of age. It is in a fairly good state of preservation; the missing parts are the right zygomatic arch and left mastoid process. All the maxillary teeth are absent and only the stump of right M₁ could be seen. Vertex presents biparietal oval depressions, probably the result of craniotabes. Perforations present in the centre of each parietal depression appear to be due to thinning out of the bone and the sharp margins suggest recent occurrence. Right mastoid is small and supraorbital ridges are only slightly developed. Sphenobasilaris is united. Coronal suture on the right side has completely synostosed and the other half is

closing while traces of commencing synostosis is present on the sagittal suture. Other sutures are open. Forehead is almost vertical to about ophryon and then passes backwards. When seen from above the skull is *ovoides*, narrow in front and expanded at the parietals. The occiput is moderately pro-

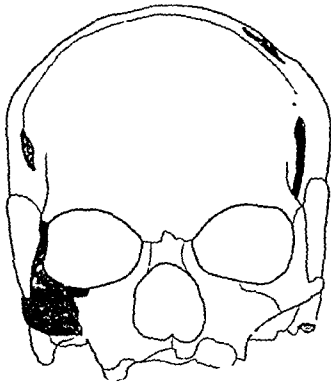


Fig. 37

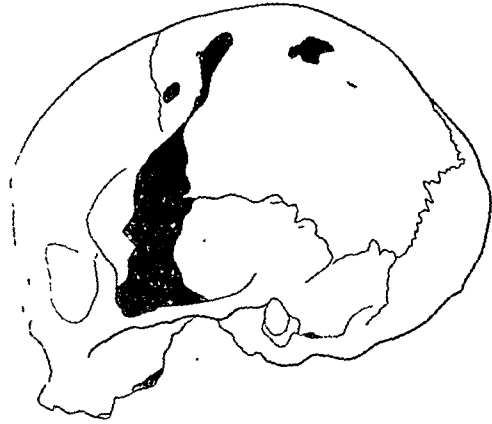


Fig. 38

truding, the contour being house-shaped. The skull is dolichocranic (L-B Index 71.27) and acrocranic (B-AH Index 87.60). Orbits are low and tend to be rectangular and mesoconchic (OI 79.49) on the left. Nasal aperture is very broad and low. The upper alveolar margin is broken.

No mandible is preserved.

SKL. H 820 (II)

The skull is that of an adult female, probably between 25 and 30 years of age. The supraorbital ridges are moderately developed and the nasion depression is shallow. The forehead is low, slightly receding and the slope is gradual with some degree of flattening at the bregma. From the top, the skull is *byrsoides* in shape with bulging at the parietals. The orbits are low and rectangular (OI 76.09). The face is low and broad with a marked subnasal prognathism. The nasion is not sunken at the root and the inter-orbital breadth is broad (18.00 mm). The nasal bridge is concave and the shape of the nasal bone is broad constricted. The inferior border of the pyriform aperture is *amblykraspedotic*. Palate is long, narrow and *paraboloid*. All the maxillary teeth have erupted and the cusps are badly worn down.

The mandible is moderately built with moderately prominent *symphysis menti*. The mandibular teeth are badly worn. Marked attrition of the incisors clearly states that the teeth during life met in an edge to edge bite (Pl. XI : 3). The mandibular angle is 120° and the bigonial width 87 mm.

SKL. H 820 (III) [Fig. 40]

The skull belongs to an adult male between 21 and 25 years of age at death. Portion of left frontal and left parietal are reconstructed, while left mastoid is broken at the tip. It is large with big mastoids, well-developed supraorbital ridges, strong muscular attachments and in an excellent state of preservation. Intracranial capacity is 1400.84 c.c. Nose is depressed at the root and the space



Fig. 1 Skl. II 806/A



Fig. 2 Skl. II 815

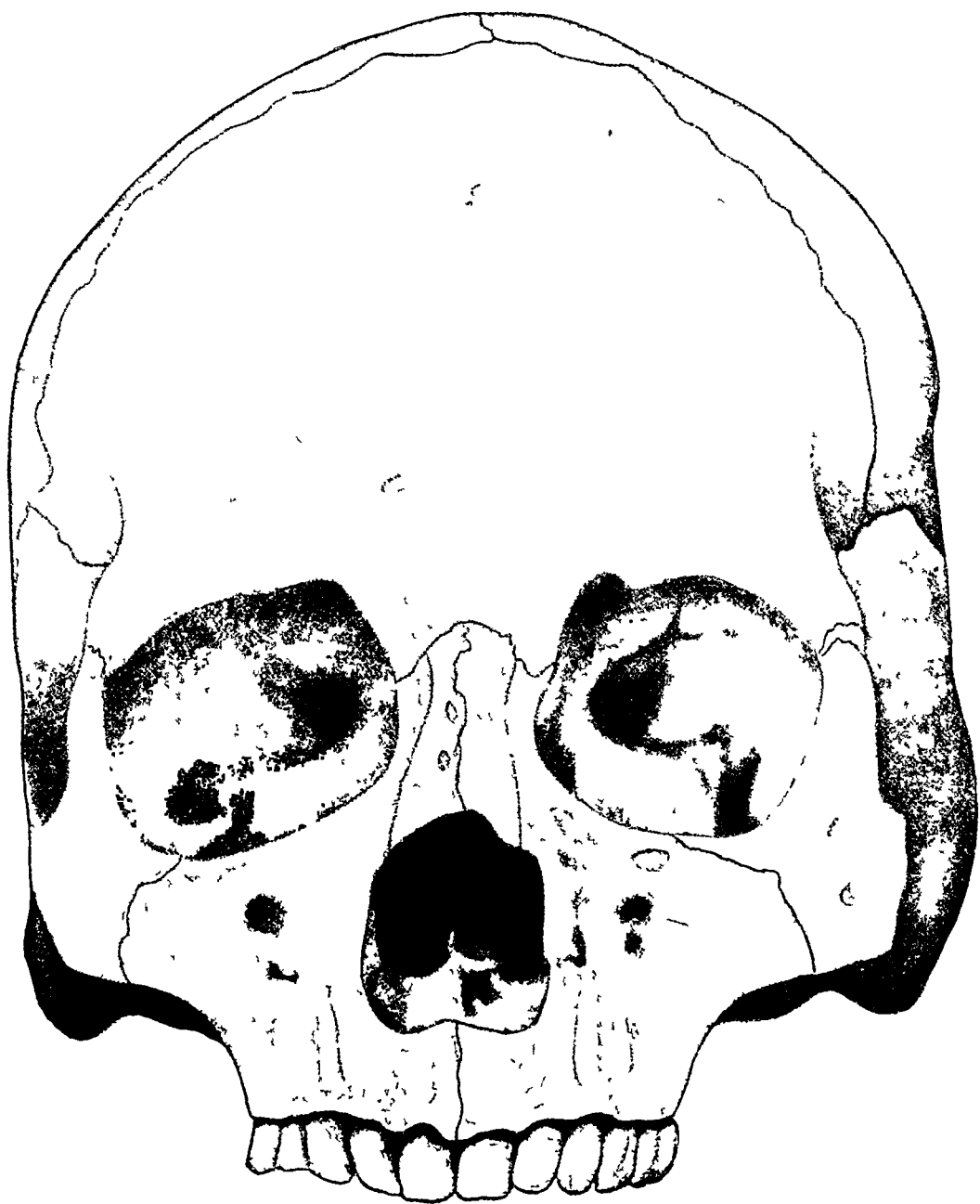


Fig. 3 Skl. H 820 (II)



Fig. 4 Skl. 2

MANDIBLES SHOWING ATTRITION OF INCISOR TEETH



Norma Frontalis

DIOPTOGRAPH TRACING (WASH) : MALE SKL. 10 (Natural Size)

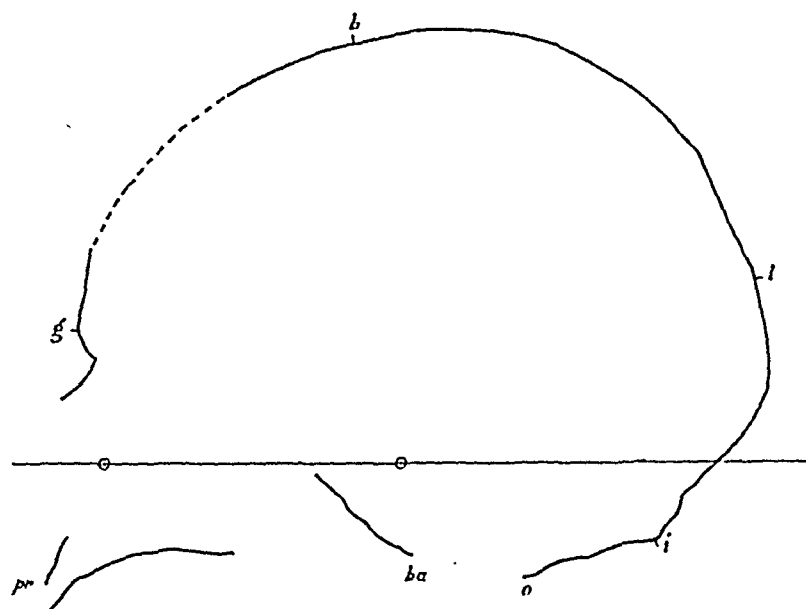


Fig. 40 SKL. H 820 (III)

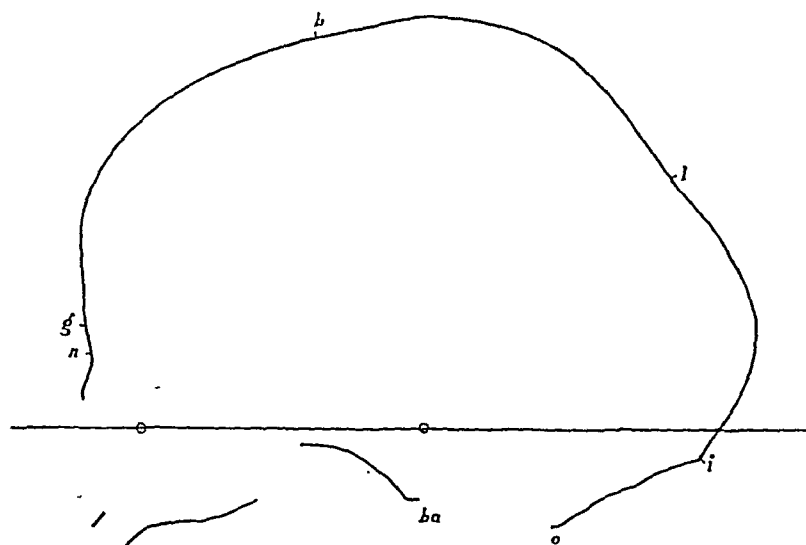


Fig. 39 SKL. H 820 (I)

MID-SAGITTAL CURVE ($\frac{1}{2}$ NATURAL SIZE)

between the two orbits is 20 mm. Viewed from the top, the skull is *byrsoides* in outline, and the *arcus zygomaticus* is bulged out from the contour line. The forehead is receding and passes back into an uniform curve. Auditory meatus lies nearly midway between the nasion and inion. The vault of the skull presents a slight trace of sagittal keel (*scaphocephaly*). Occiput moderately projects out. Face is very broad in comparison to its height, the superior facial index is on the margin of hyper-euryon—euryon (44.20). The orbits are low and rectangular and lie within the chamaeconchal class (right OI 66.67 and left OI 75.90). Nose is wide (chamaerrhine, NI being 54.17), and the pyriform aperture is *oxykraspedotic*. The skull is dolichocranic (L-B Index 72.83), hypsicranic (L-AH Index 64.40) and acrocranic (B-AH Index 88.43). Palate is short, broad and *parabolic*. The width of the palate at the second molar alveoli is 43 mm and the palatal length is 44 mm. All the teeth have erupted but the incisors, canine and left PM_1 have fallen out; the cusps are badly worn down. Subnasal prognathism is present.

The skull is without mandible.

SKL. 1 [Figs. 41, 42, 43]

The skull is well preserved. It is typically male, having well developed glabello-superciliary region, large mastoids and the nuchal impressions in the occipital bone are strongly marked. The face is broad and low, and the malar bones are strongly developed. In profile, the forehead is low, slightly retreating and ascends gradually into a somewhat low vault; the occiput recedes obliquely with a moderate projection. A portion of the roof of the skull shows keeling of the vault (*scaphocephaly*) sagittally with a para-sagittal depression. The skull is dolichocranic (L-B Index 74.47), orthocranic (L-AH Index 61.17) and metriocranic (B-H Index 93.57 ?). The nasal bridge is long, concave with slight aquilinity of nose and the nasion is deeply depressed at the root. There is also evidence of subnasal prognathism and the forward growth of the facial region from the meatus is marked. Posterior part of the alveolar margin of the maxilla is absorbed. The calculated cranial capacity of the skull is 1437.82 c.c. i.e. distinctly euencephalic.

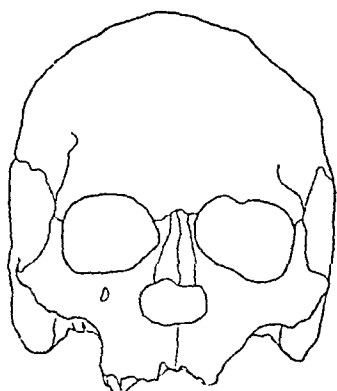


Fig. 41

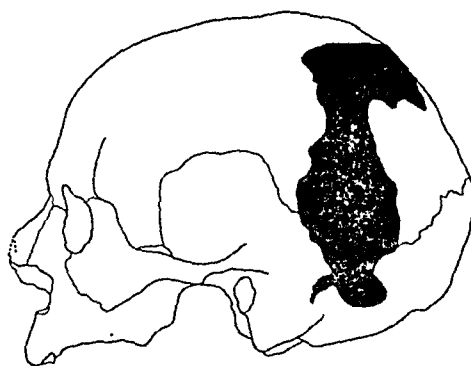


Fig. 42

Mandible which has survived in pieces had to be restored. Posterior part of the alveolar margin of the mandible shows absorption. The mandible is strongly built with prominent and everted chin.

The corpus is massive and ramus broad. The muscular attachments for the masseter and internal pterygoid are distinct. The angle formed by the ascending ramus with the body of the mandible is 118 degree.

The extremity bones are powerful in structure with strong muscular attachments. The stature is about 182.90 cm, estimated according to Dupertuis and Hadden's 'general formulae'.

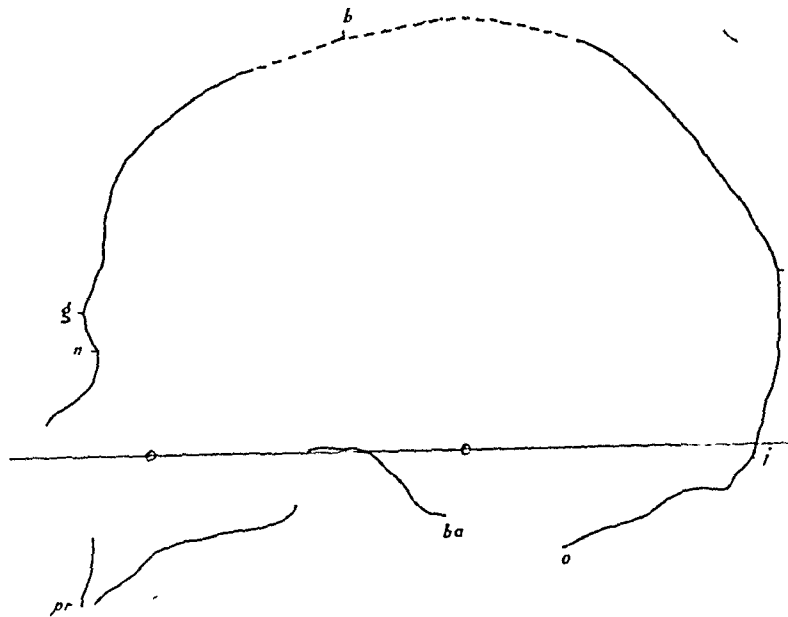


Fig. 43 SKL. 1

SKL. 2 [Fig. 44; Pls. XI : 4, XXVI]

The skull is that of an adult female of about 30 years of age. The skull is complete excepting for the part of left parietal and left temporal bones. Left anterior wall of the frontal sinus is broken. Supra-orbital ridges are feeble, mastoids small and the glabellar region is broken. The cusps of the teeth show considerable attrition, particularly the degree of wear of both mandibular and maxillary incisor teeth suggests definitely an 'edge to edge' bite. Seen from above, the contour of the norma verticalis is elongated oval in outline. Seen from the side, the forehead is low and the slope is gradual; occiput is moderately protruding. The skull is dolichocranic (L-B Index 72.19) and orthocranic (L-AH Index 59.55 ?). Total facial index is mesoprosopic (89.26), and superior facial index is mesen (52.07); thus the face is medium in height-breadth ratio. The right orbit is rectangular in shape sloping laterally and downwards (mesoconchic OI 83.12), while left is distorted. The nasal aperture is broad and medium and chamaerrhine (NI 54.35). The nasal bridge is high and prominent.

Mandible is narrow and compressed at the gonial angles, its bigonial width being 70.0 mm. Corpus is moderate in bulk and ramus moderate in width. All the teeth have erupted excepting left M_3 , which appears to have been newly cut. The lower dental arcade is *upsiloid* in shape.

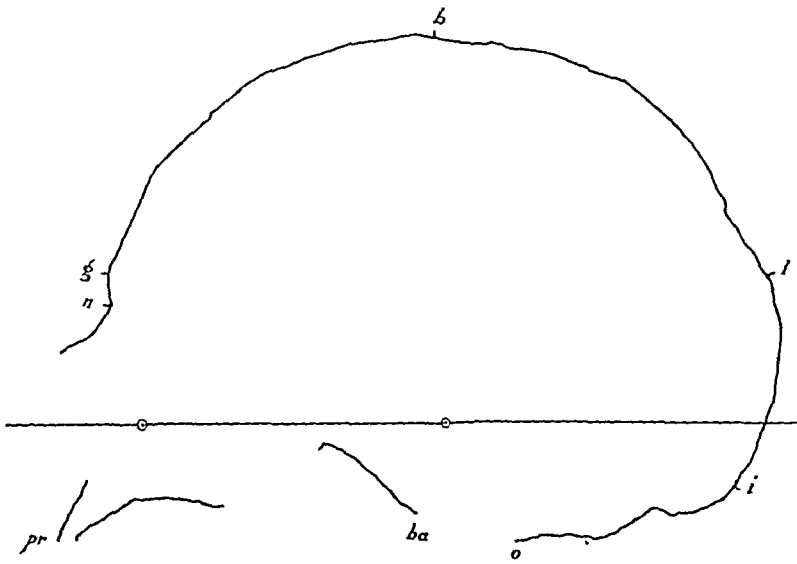


Fig. 44 SKL. 2

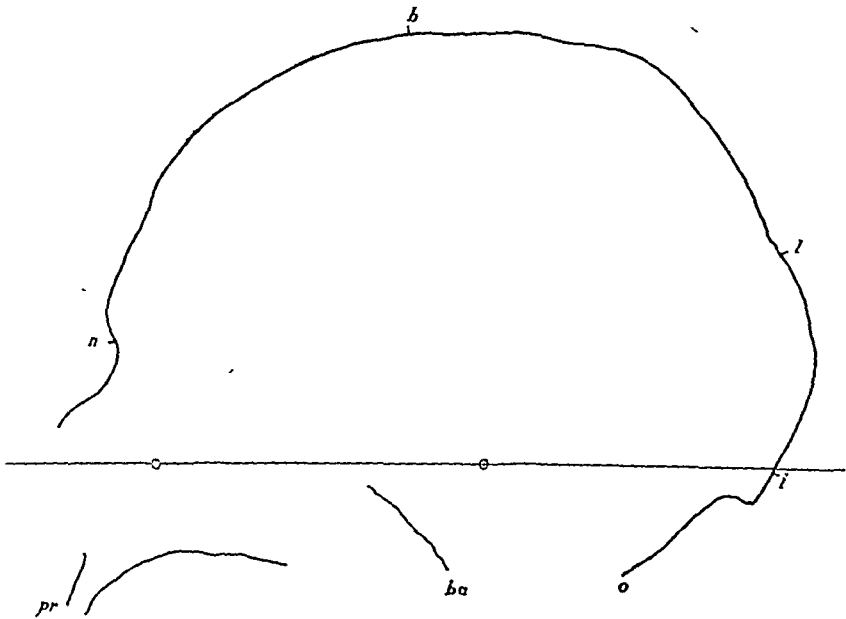


Fig. 45 SKL. 10

MID-SAGITTAL CURVE (1/2 NATURAL SIZE)

SKL 10 3 7 5 2 4 8 9 6 1

The Journal of the Royal Society of Medicine (1955: 204) at Nal in S. 35: 13-14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 84

[illegible]

The number of β particles emitted per unit volume of material is given by the equation $N = \frac{1}{V} \int_0^t \lambda N_0 e^{-\lambda t} dt$, where N_0 is the initial number of nuclei, λ is the decay constant, and V is the volume of the material.

The statute is amended by adding (b) to read: "The Secretary shall, in any case in which the Secretary is not satisfied with the results of the investigation, cause the investigation to be conducted by a special agent or by a committee of the Board of Directors of the Federal Reserve Bank of the District in which the investigation is being conducted."

ANALYSIS

Analyzing in detail the metrical and morphological descriptions (Collective Table A-B and G-H) of the cranial materials from Cemetery R 37, it is revealed that at least two physical types are found to have been present in the population. For the sake of convenience and in order to avoid confusion as to racial nomenclatures, these two have been termed by us as Type A and Type A'. Both the types, A and A' are long-headed in character.

Of thirty-six skulls of Cemetery R 37, thirty-one adult skulls are capable of being classified. Of these, twenty-one adult skulls are attributable to Type A and ten adult skulls to Type A₁. Of the remaining five skulls, two non-adults and two defective adult female skulls [H 801 & H 779 (d)] have not been considered, while one adult male skull H 793 (A) could not be attributed to either of

the types because of its excessive massiveness, broad head and large dimensions of certain metric characters. Type-wise and sex-wise distribution of adults is tabulated below :

TYPE A				TYPE A ₁			
MALE		FEMALE		MALE		FEMALE	
H 779 (e), H 793,		H 779 (a), H 780,		H 793 (B), H 811,		H 779 (c), H 791/A,	
H 794, H 796 (B),		H 788, H 795/A,		H 818		H 798/A1, H 805,	
H 798 (A), H 798 (B),		H 798 (a), H 806/A,				H 820 (I), H 801/A,	
H 798 (C), H 806,		H 812, H 816,				H 817	
H 820 (iii), Skl. 1,		H 820 (II), Skl. 2					
Skl. 10							
Total	11	10		3		7	

TYPE A

People of Type A are numerically stronger and may be considered as basic of Cemetery R 37. Mean values with standard errors, ranges and indices of Type A males are presented in Tables 10-15 and that of females in Tables 28-33, while photographs and diopograph drawings of two skulls (one male and one female) representing Type A are given in Plates XIII, XIV and Figures 46-48, 49-51.

Before proceeding to a detailed discussion of each of the types indicated, it will be worthwhile to mention their salient morphological characters. Essential cranio-facial features of Type A males and females are noted below :

MALE			FEMALE		
Length-breadth index	Dolichocranic	(71.24 ± 0.82)	Dolichocranic	(73.02 ± 1.33)	
Length-height index	Orthocranic	(71.34 ± 1.01)	Orthocranic	(70.27 ± 0.87)	
Breadth-height index	Acrocranic	(100.19 ± 1.26)	Metriocranic	(97.69 ± 1.97)	
Length-auricular height index	Orthocranic	(60.80 ± 0.79)	Orthocranic	(61.64 ± 0.73)	
Total facial index	Leptoprosopic	(93.60 ± 4.35)	Mesoprosopic	(89.26)	
Superior facial index	Mesen	(51.96 ± 2.26)	Mesen	(51.61 ± 0.42)	
Orbital index*	Mesoconchic	(80.80 ± 1.82)	Mesoconchic	(81.19 ± 1.26)	
Nasal index	Chamaerrhine	(51.58 ± 1.92)	Chamaerrhine	(50.96 ± 1.32)	
Palatal index	Leptostaphylin	(79.31 ± 3.73)	Brachystaphylin	(88.27 ± 2.11)	
Trans. fronto-parietal index	Eurymetopic	(70.60 ± 0.80)	Eurymetopic	(72.17 ± 1.86)	

It is difficult to find any significant sex difference when the above essential metric features of Type A skulls are compared. In cranial index, however, the females have a slightly higher average than the males, a feature more often found in dolichocephalic races, a distinction first noted by Stockard (Kappers 1934 : 3). In Panjabi male and female crania similar observation was made by Pearson (1897 : 368).

* Pooled average of right and left orbital index.

The average value of absolute dimensions of both the sexes are: Cranial length 1600 mm for the males and 1521 mm for the females, orbital breadth 130.95 mm for the males and 131.62 mm for the females, auricular height 114.52 mm and 111.14 mm for the males and the females respectively; nasal height 52.22 mm for the males and 48.13 mm for the females; nasal breadth 27.19 mm for the males and 24.85 mm for the females, external infra-orbital breadth 19.44 for the males and 18.62 for the females, orbital height 45.14 mm for the males and 41.55 mm for the female, orbital breadth 42.14 mm for the males and 40.75 mm for the females, minimum frontal diameter 94.5 mm for the males and 90.15 mm for the female, vertical transverse arc 100.55 mm for the males and 97.1 mm for the females.

In all the morphological dimensions the males have a more archaic pattern than the females. But the sex difference is quite apparent in Type A skulls if the morphological traits which are taken into consideration. These may be laid down as follows:

TYPE A		
CHARACTERES	MALE	FEMALE
Development of Supra-orbital ridges	Developed	Weakly developed
Slope of the forehead	Steep	Less steep
Depression of the nasal root	Deep	Shallow
Protrusion of the nasal bone	Marked protrusion, rounded and slightly flattened posteriorly	Weakly protruding, rounded posteriorly
Nasal process	Large	Small
Nasal spine	Marked and long	Weakly protruding
Subnasal prominence	Marked	Weakly protruding

A careful examination of all the skulls belonging to Type A, has revealed important facts about some of the morphological characters which merit mentioning. These are prominent supra-orbital ridges, low receding forehead, ill-arched orbital contour, protruding or squint 'cheeking' abruptly downwards and forwards, low rectangular orbital cavities inclined laterally and downwards, deep nasion depression, 'wing-shaped' and short nasal bone, broad face, and strong malarial impression. In this connection specially one male skull No. H 779(e) deserves mentioning; although the sum total of the features including the neurocranium of the said skull exhibit Type A characters, the splanchnocranium reveals some features to be considered as Type A₂.

Now, special attention is drawn to five skulls (3 males Nos. H 791, Skl. 1, Skl. 10 and 2 females Nos. H 806/A, H 812) attributed as Type A, which exhibit more rugged features having long, slightly acquiline nose and narrow nasal aperture with comparatively narrow facial width in relation to its height. These crania have well-arched vault and well-filled temporo-parietal region.

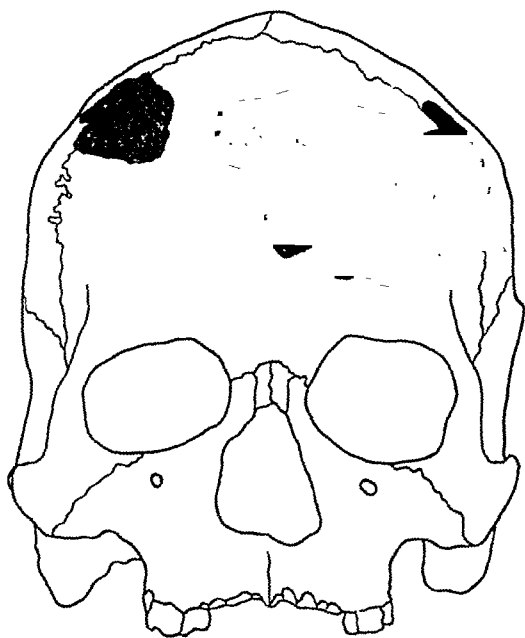


Fig. 46 *Norma Frontalis*

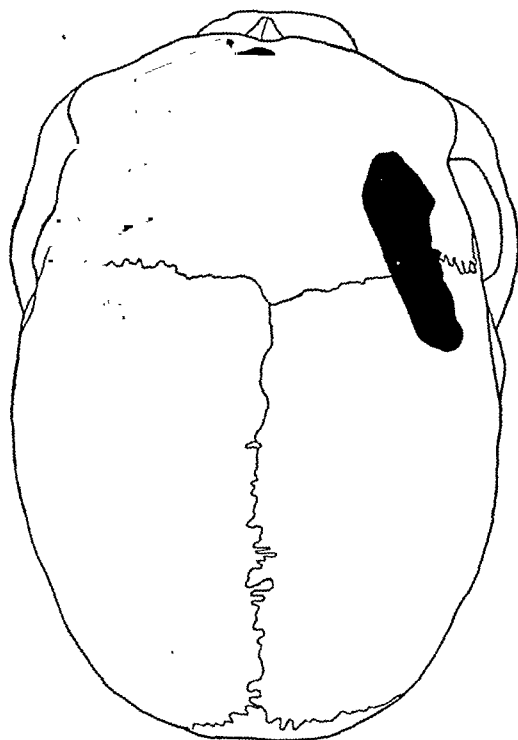


Fig. 47 *Norma Verticalis*

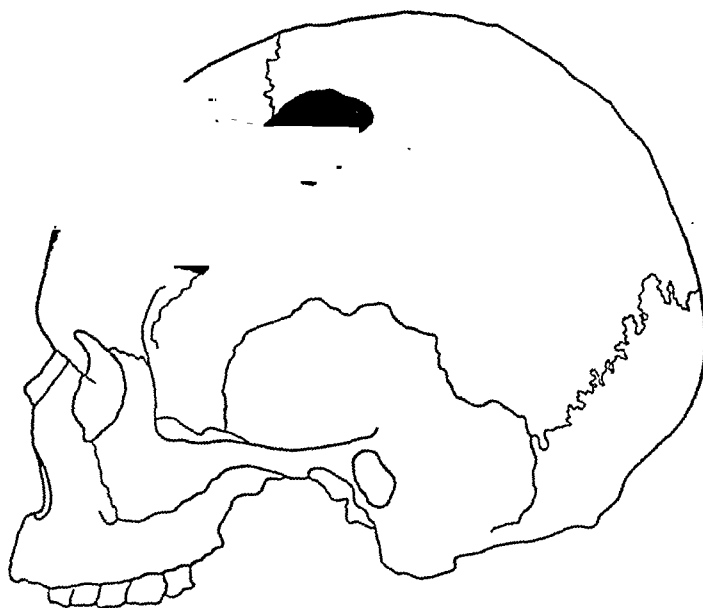
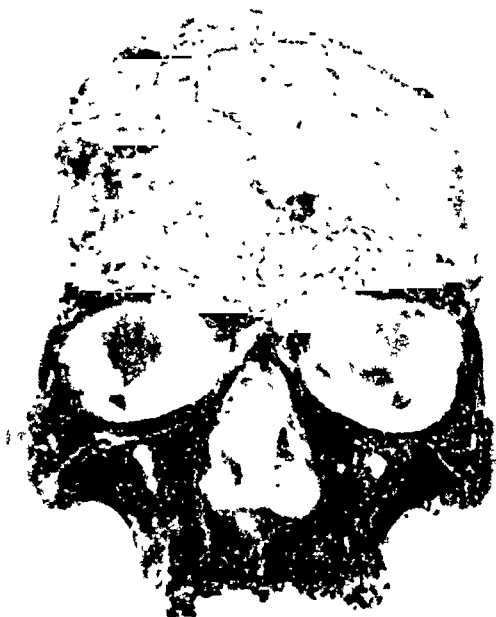


Fig. 48 *Norma Lateralis*

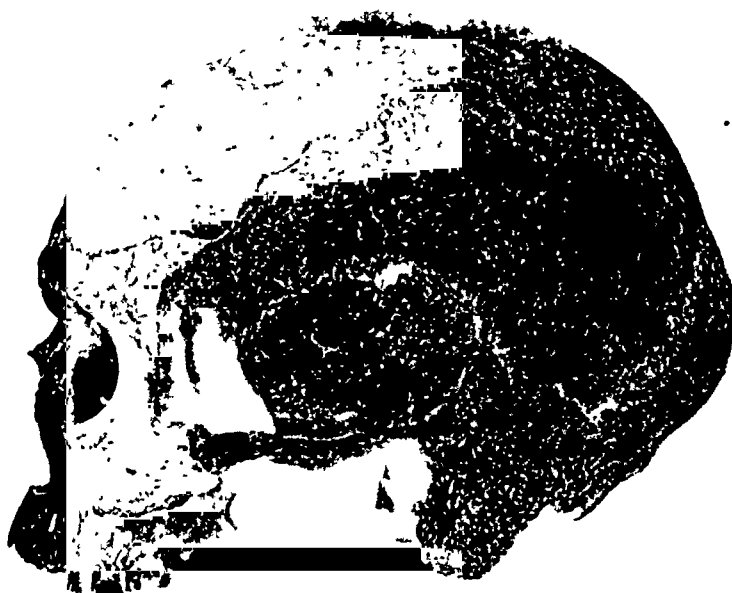
Figs. 46, 47 and 48. Diophtographic contours of Type A Male [Sk1, H 820 (III)] of Cemetery R 37



Norma Frontalis



Norma Verticalis



Norma Lateralis



Norma Frontalis



Norma Verticalis



Norma Lateralis

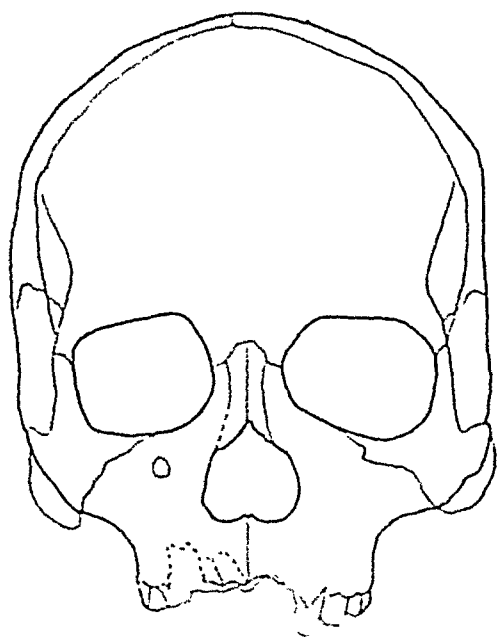


Fig. 49 *Norma Frontalis*

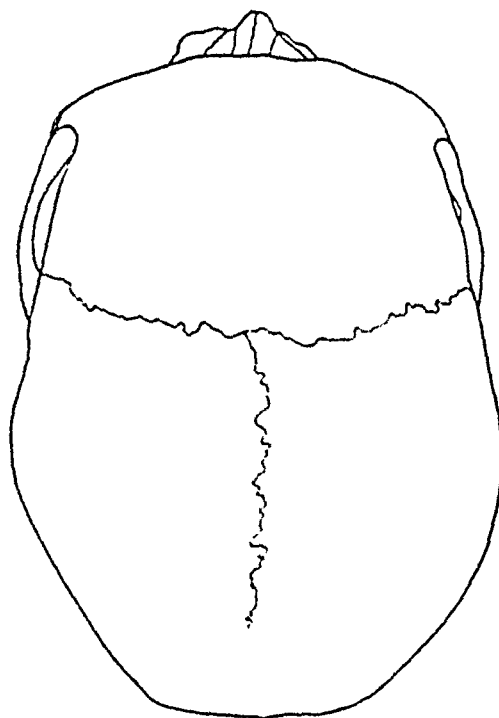


Fig. 50 *Norma Verticalis*

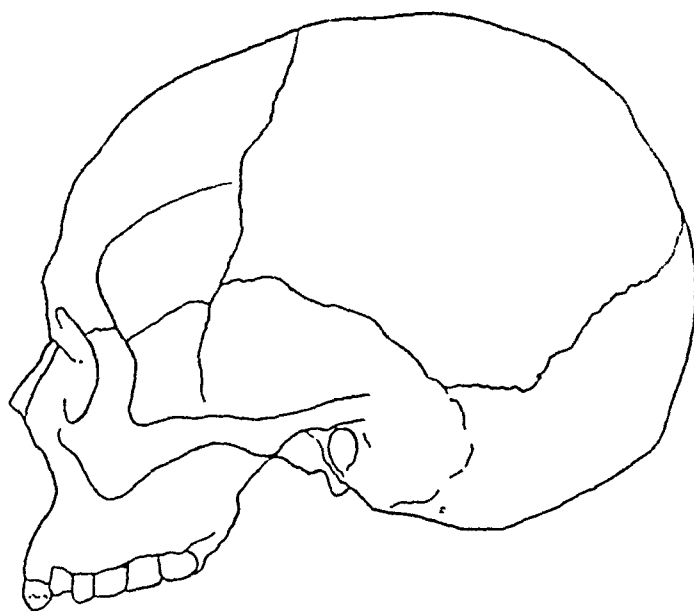


Fig. 51 *Norma Lateralis*

Figs. 49, 50 and 51. Dioptrigraphic contours of Type A Female [Sk. H 798 (a)] of Cemetery R 37

TYPE A₁

A little less than 30% (3 males and 7 females) of the collection under study of Cemetery R 37 has been placed under Type A₁.

In Tables 16-21 the mean values with standard errors, ranges and indices of males of Type A₁ are given and in Tables 34-38 those of females given. Photographs and dioptograph drawings of two skulls (one male and the other female) representing Type A₁ are produced in Plates XV-XVI and in Figures 52-57.

Some essential features of Type A₁ male and female are detailed below :

	MALE		FEMALE	
Length-breadth index	Dolichocranic	(70.44 ± 0.75)	Dolichocranic	(72.25 ± 1.92)
Length-height index	Orthocranic	(71.63)	Orthocranic	(70.43 ± 1.07)
Breadth-height index	Acrocranic	(100.75)	Acrocranic	(100.77 ± 2.36)
Length-auricular height index	Hypsicranic	(63.09 ± 0.79)	Orthocranic	(62.20 ± 1.03)
Superior facial index	Mesen	(50.81)
Orbital index	Mesoconchic	(79.83 ± 2.40)	Hypsiconchic	(85.37 ± 1.10)
Nasal index	Mesorrhine	(49.75 ± 1.19)	Chamaerrhine	(51.48 ± 1.72)
Palatal index	Mesostaphyline	(83.56 ± 5.94)	Brachystaphylin	(93.72 ± 2.76)
Trans. fronto-parietal index	Eurymetopic	(74.52)	Eurymetopic	(70.65 ± 1.87)

It appears that sexual difference is present only in three indices, namely palatal, orbital and trans. fronto-parietal. Among females, auricular height, nasal height and orbital breadth are slightly lesser in dimension. Auricular height is 111.36 mm for females and 117.33 mm for males ; nasal height 48.90 mm for females and 51.00 mm for males ; orbital breadth 39.72 mm for females and 41.96 mm for males. All the other essential indices are more or less uniform between the sexes.

The measurements which warrantably prove the homogeneity of the type are : Cranial length 186.00 mm for males and 180.08 mm for females ; cranial breadth 131.00 mm for males and 129.92 mm for females ; basion-bregma height 132.00 mm for males and 128.60 mm for females ; nasion-inion length 173.33 mm for males and 167.17 mm for females ; longitudinal arc 373.00 mm for males and 374.80 mm for females.

The cranial capacity of males has a higher average than females, which is 1378.67 cc. and 1281.12 cc. respectively.

Some of the morphological traits of males and females of Type A₁ are given below. They indicate that sexual difference is practically absent:

CHARACTERS	TYPE A ₁	
	MALE	FEMALE
Development of supraorbital ridges	Slight	Slight to Absent
Slope of the forehead	Vertical	Vertical
Depression of the nasal root	Shallow	Shallow to Absent
Protuberance of the occipital region	Moderately protruding	Moderately protruding
Mastoid process	Medium	Small
Nuchal plane	Muscular ridges Medium to Slight	Muscular ridges Slight
Subnasal prognathism	Slight to Absent	Absent

It appears that Type A₁ crania are notable for ill-defined muscular relief and general gracility. Both glabella and supraorbital ridges are less developed, forehead narrow vertical, occiput moderately protruding, upper face is of moderate breadth and height, nose narrow-constricted and high-pitched. On the whole, 'total morphological pattern' of Type A₁ skulls resembles Mohenjo-daro 'Mediterranean' type.

DISCUSSION

In summing up the physical characteristics of the population of Cemetery R 37, we find that the oldest inhabitants of Harappa, so far discovered, consisted of mainly two types, namely, Type A and Type A₁, both of which were long-headed.

Type A, which is more numerous represented (11 males and 10 females), has large, strongly muscled skulls, having low receding forehead, pronounced supraorbital ridges, relatively low rectangular orbits, broad nose sunken at the root, upper face broad, occipital line marked by a prominent occipital protuberance (may be due to forward development of the brain-case) and rather broad cheek bones.

The average length-breadth index for males is 71.24, for females 71.34, for males 71.34, for females 70.27 and breadth-height index for males 71.34, for females 70.27. On the whole, the Type A skulls are mostly dolichocranic, characterized by

Among the Type A skulls, there are at least five skulls (Skl. 10 and 2 females Nos. H 806/A, H 812), which deserve special mention. They have strong cranial relief entered with

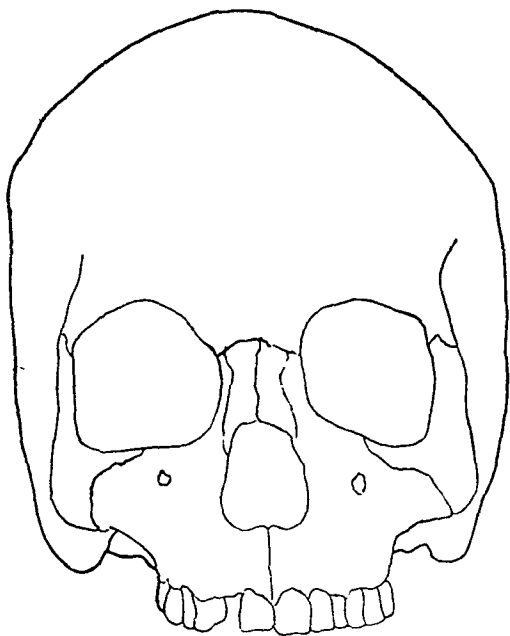


Fig. 52 *Norma Frontalis*

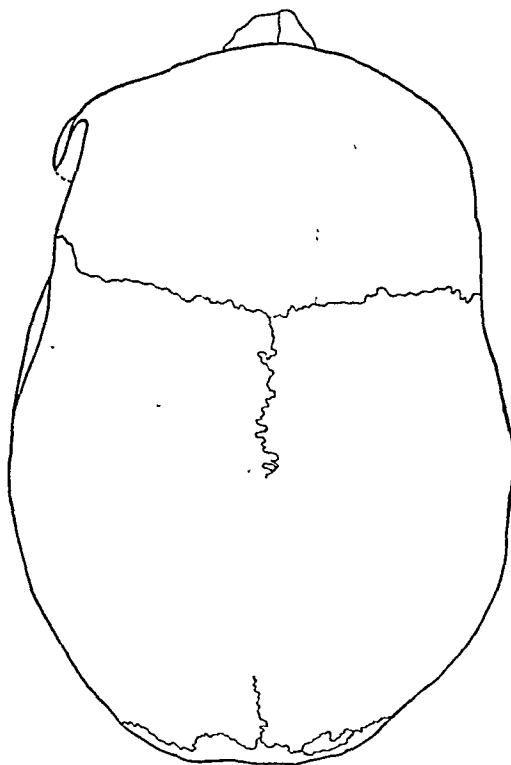


Fig. 53 *Norma Verticalis*

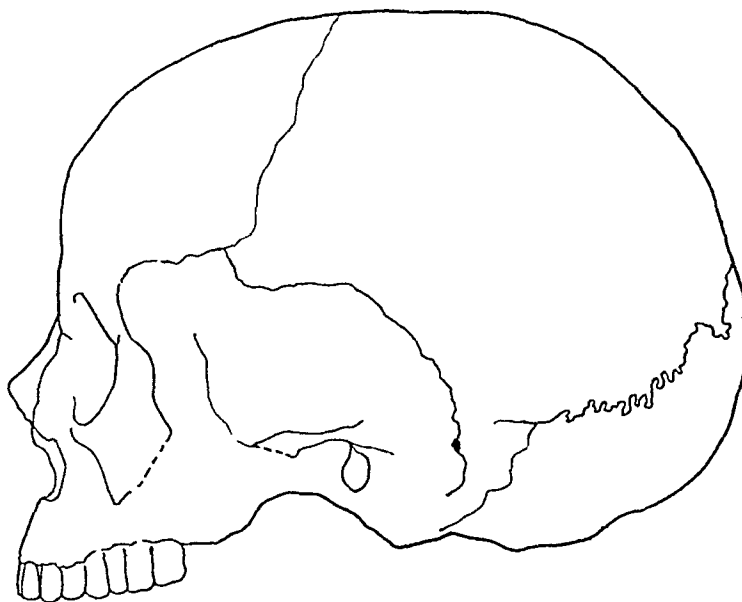
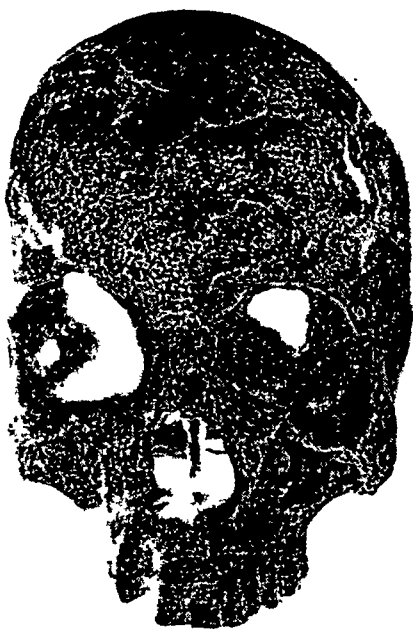


Fig. 54 *Norma Lateralis*

Figs. 52, 53 and 54. Dioptrigraphic contours of Type A₁ Male [Sk1. H 793 (B)] of Cemetery R 37



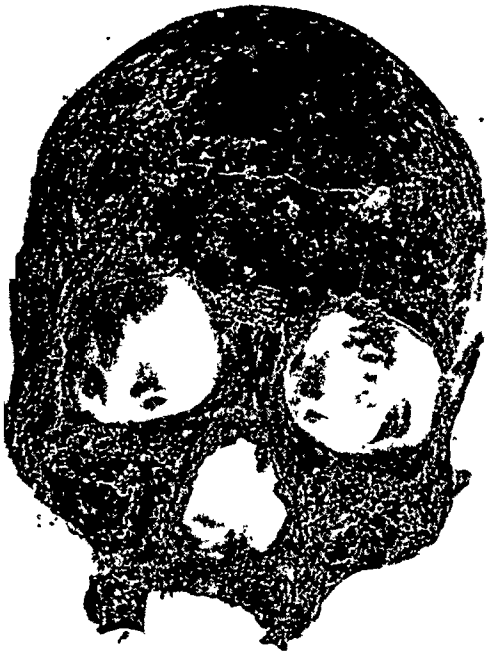
Norma Frontalis



Norma Verticalis



Norma Lateralis



Norma Frontalis



Norma Verticalis



Norma Lateralis

Photographs of Type A, Female [Sk. H 801/A] of Cemetery R 37

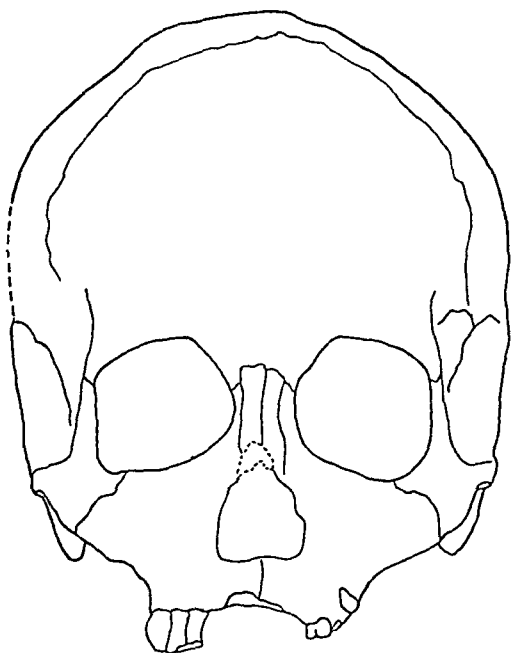


Fig. 55 *Norma Frontalis*

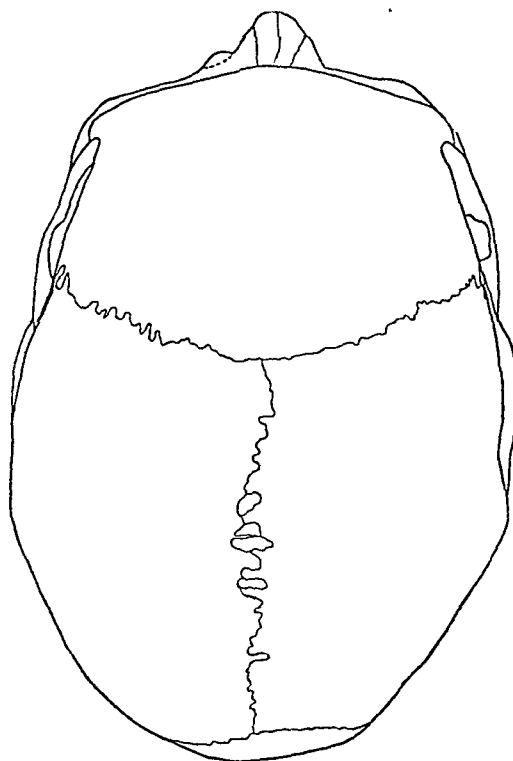


Fig. 56 *Norma Verticalis*

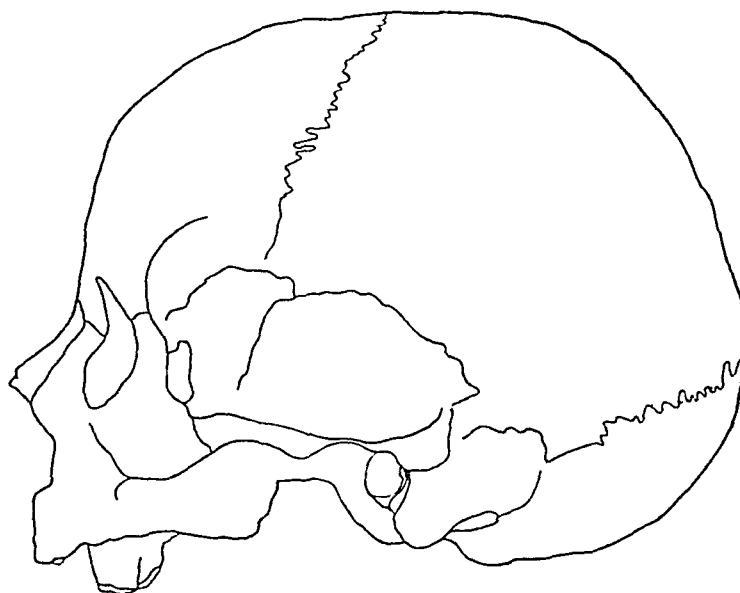


Fig. 57 *Norma Lateralis*

aperture with comparatively narrow facial width (Pl. XVIII). Furthermore, the male skulls (Nos. Skl. 1 and Skl. 10) exhibit some tendency toward sagittal keeling of the vault. It is, however, difficult to state, whether these five crania are merely expected variants or they pose a separate entity. But we may well ignore the latter view following Krogman (1937 : 216), as the sum total of cranio-facial features are not differing significantly, while the outstanding features are fairly well in agreement. Sewell and Guha (1931 : 641-642) tried to show the evidence of relationship between 'the Kish skulls with a nose that is long and narrow ; in the Al'Ubaid skulls the nose is slightly shorter and distinctly broader, and these changes are more marked in the Adittanallur and Mohenjo-daro skulls, which have chamaerrhine noses, and finally the maximum alteration is found in the Veddas. Similarly, the orbit is very low in the Kish skulls and reaches its maximum height in the Veddas. Another alteration in the character in the face is the change from orthognathism to prognathism.... The bizygomatic breadth, again, shows a graded series from the Kish to the Adittanallur skulls'. And if such variation is possible within normal range, then it is not unjustifiable to lump together the present series with Type A. These five skulls with relatively rugose muscular attachments (particularly in males) and few distinctive features already mentioned can be attributed to Krogman's (1940 : 17) 'Proto-Nordic' type of Hissar or Dixon's 'Caspian', while rest of the skulls also belonging to Type A conforms with his (Krogman) Pseudo-Australoid type. The mean values of few important features of the male Type A skulls similar to Proto-Nordic and Pseudo-Australoid types are given in the table below. The chief difference between them lies mainly on the facial architecture. They, however,

Characters	Mean values of the male Type A crania similar to Proto-Nordic type	Mean values of the male Type A crania similar to Pseudo-Australoid type
Cranial capacity	1406.12 cc.	1369.03 cc.
Cranial module	155.06 mm	150.54 mm
Nasal index	51.67	54.02*
Stature	1830.63	1746.70

do not differ to any great degree, most of the measurements and indices showing good agreement. We do not find it is justifiable to sort out the five skulls as a separate type. In this connection Hooton's (1946 : 616) view regarding the presence of Nordic strain among certain of the earlier skulls of Mohenjo-daro may also be referred to. Taking into account the morphological and metrical traits, it is reasonable to conclude that the Type A of the present series stands closer to the norms of Mohenjo-daro 'Group A' (Guha and Basu 1938 : 630-631) skulls, which has been initially designated by Sewell and Guha (1931 : 638-642) as 'Proto-Australoid' and subsequently redesignated by Sir Aurther Keith (1931 : 1002) as 'Caucasic'. Friederichs and Müller (1933 : 383) preferred to call them as 'Veddoid'. Buxton and Rice (1931 : 69) have referred to similar type of crania as 'Eurafrian'—a term coined by Sergi, Giuffrida-Ruggeri and Fleure. Coon (1939 : 87) is of opinion that the large, heavy, and purely dolichocephalic type belongs to the large- and longer-headed Mediterranean division, nearest in vault size and form to the earlier Galley Hill and Combe Capelle.

* In averaging nasal index skull No. II 779 (c) has been excluded
(for reasons see page 51 infra)

Type A₁, represented by fewer skulls (3 males and 7 females) is, on the whole, more smooth and gracile, the entire physical structure being finer and weaker. The musculature is weak, having steep forehead with faintly developed glabello-superciliary region, medium nose with no depression at the root and protruding *tuber occipitale*. There is no evidence of distinct subnasal prognathism. The average length-breadth index for males is 70.44, for females 72.25; length-auricular height index for males is 63.09, for females 62.20; and superior facial index for females is 50.81 and for males there is no definite index value due to absence of craniometric landmarks but their face appears to be mesen. In other words, Type A₁ is a dolichocranic-orthocranic type having a medium face. This Type A₁ of Harappa is similar to 'Group B' of Mohenjo-daro which has been designated by Sewell and Guha as 'Mediterranean' race. Sir Aurther Keith (1931:1002) did not, however, agree to the use of this term, while Kappers (1934:118) is convinced that the name 'Indo-European' or 'Caspian' race used by Dixon (1923:483) is more appropriate than the name 'Mediterranean' used by Sewell and Guha. In general, Type A₁ skulls differ from Type A more in morphological features than in absolute measurements and cranio-facial proportions.

B. EXTREMITY BONES

Due to fragmentary condition very small number of extremity bones could have been utilized for study. Limb bones described here comprise those which are intact or nearly so. Individual measurements and indices of the long bones are given in detail in the Collective Table L, and average values for the principal measurements and indices are entered in Tables 6—9

In general, extremity bones representing Cemetery R 37 are long and powerful in structure. In this respect Skl. 1 and Skl. 10 deserve special mention for their unusual length and large muscle insertions. On the other hand Skl. H 818 and H 811 are slender with moderate to weak muscular markings.

HUMERUS

Measurements have been made on eight adult humeri (five right and three left) on which most measurements could be taken. Of the eight humeri, maximum length of Skl. 10 is remarkably high (389 mm). Mean values* of some important measurements and indices of humeri are given in Table 6. It shows that mean maximum length is 343 mm and 303 mm for males and females

TABLE 6
Humerus

Characters	MALES			FEMALES		
	n	Range	Mean	n	Range	Mean
Maximum length	5	301.0 - 389.0	343.20	2	293.0 - 314.0	303.50
Breadth of proximal epiphysis	4	45.0? - 56.5	52.00	2	42.0 - 43.0	42.50
Breadth of distal epiphysis	4	57.0 - 72.0	65.50	2	52.5 - 53.0	52.75
Circumference of the shaft at the middle	5	57.0 - 77.0	66.80	2	52.0 - 55.0	53.50
Minimum circumference of diaphysis	5	55.0 - 65.0	58.80	3	50.0 - 52.5	50.83
Robusticity index	5	14.4 - 18.31?	17.24	2	15.92 - 17.06	16.49

* Unless otherwise stated the right and left bones will be put together.

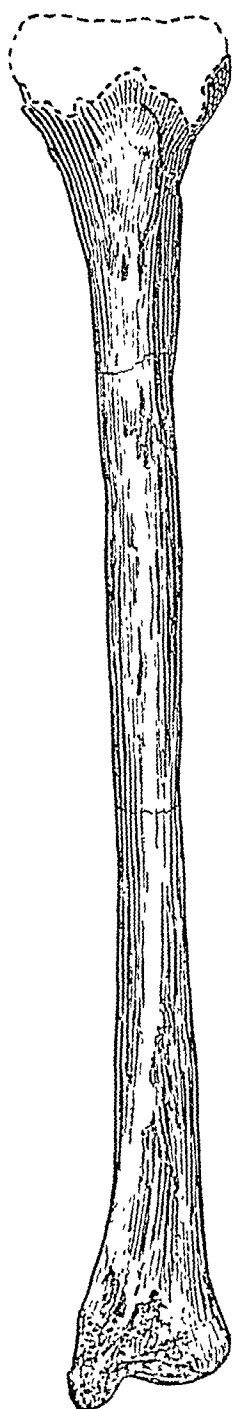


Fig. 1 Skl. 2
Female : Type A

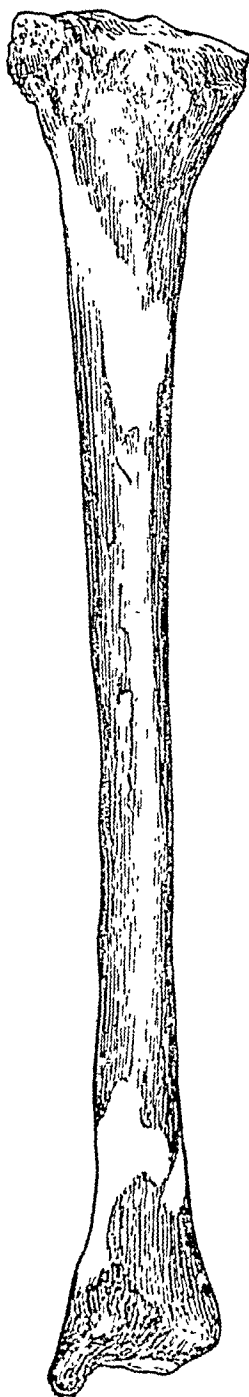


Fig. 2 Skl. H 818
Male : Type A₁

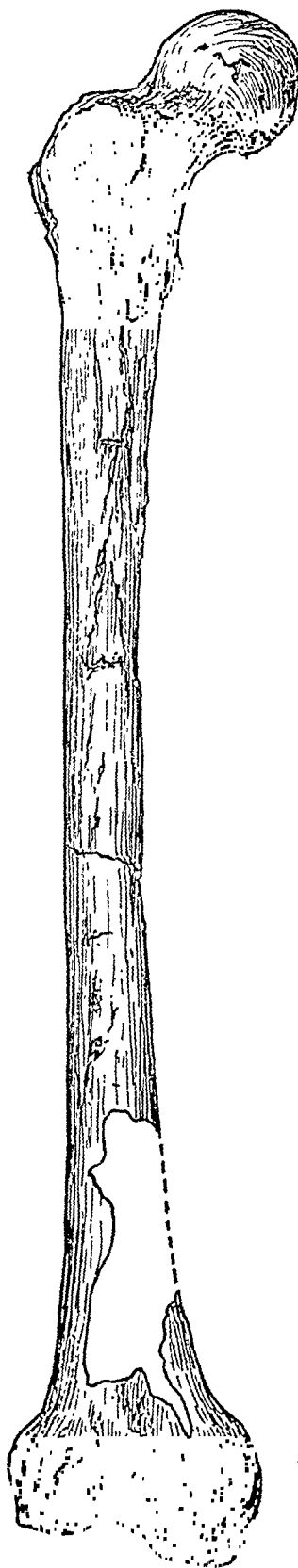


Fig. 3 Skl. H 780
Female : Type A

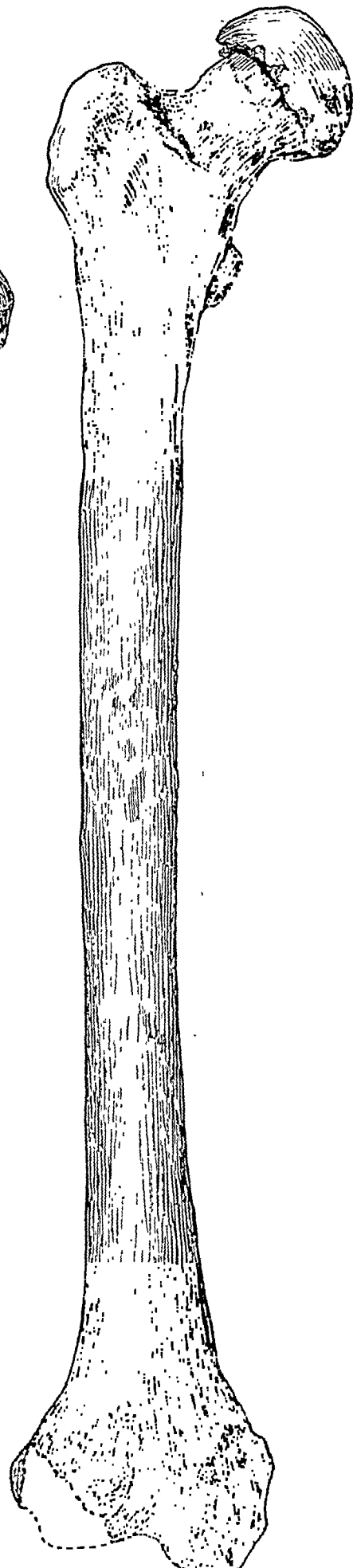


Fig. 4 Skl. 1
Male : Type A



Frontal view



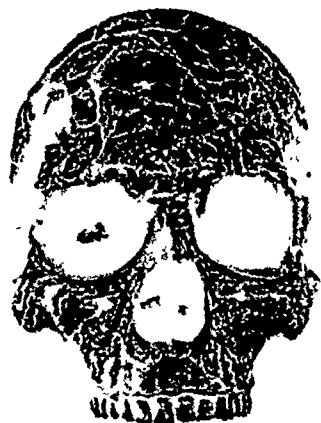
Vertical view



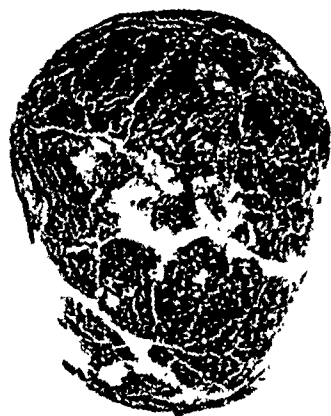
Left lateral view



Occipital view



Frontal view



Vertical view



Left lateral view



Occipital view



Frontal view



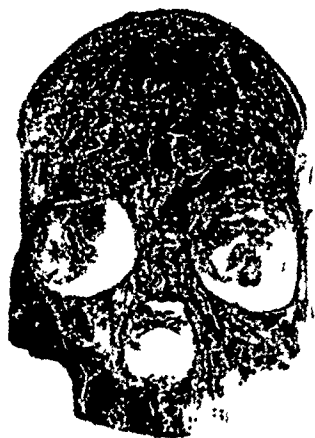
Vertical view



Left lateral view



Occipital view



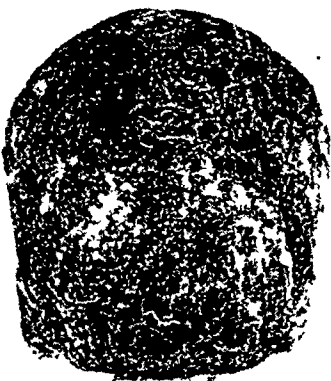
Frontal view



Vertical view



Left lateral view



Occipital view



Frontal view



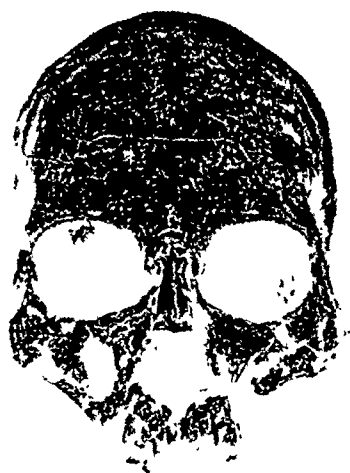
Vertical view



Left lateral view



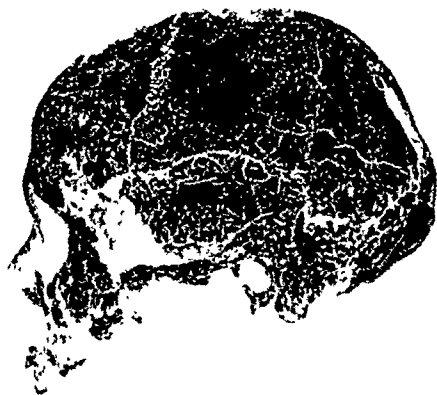
Basal view



Frontal view



Vertical view



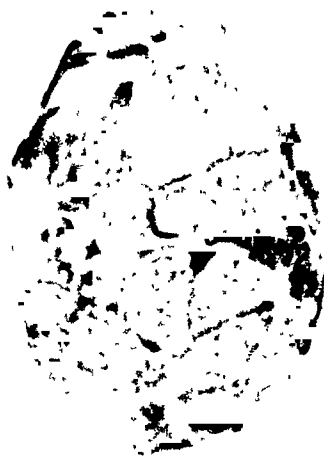
Left lateral view



Occipital view



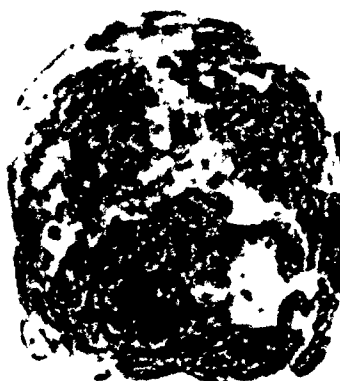
Frontal view



Vertical view



Left lateral view



Occipital view

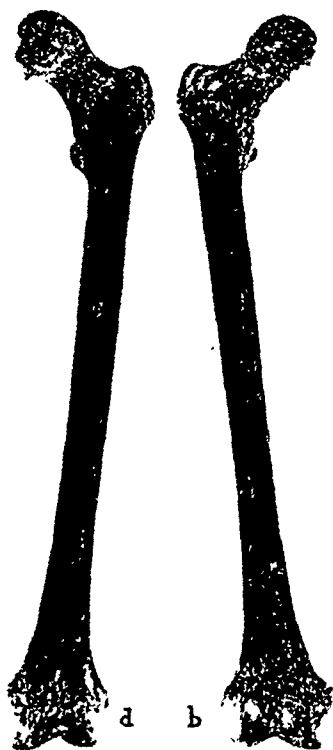


Fig. 1 Anterior aspect of the Femora of Skl. 10
a, left; b, right

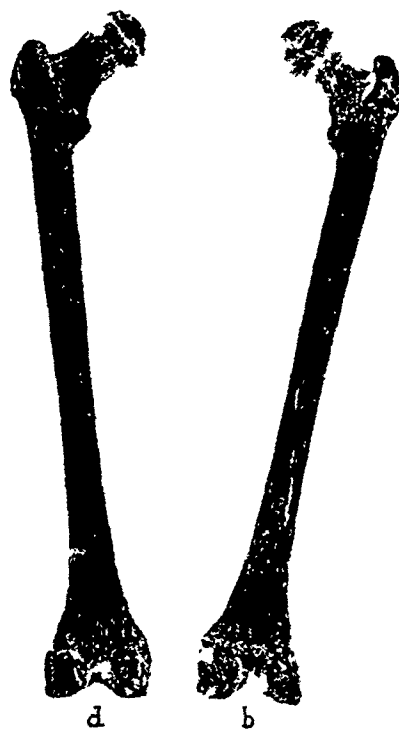


Fig. 2 Posterior aspect of the Femora of Skl. 10
a, left; b, right



Fig. 3 Anterior view of the left Tibia and Fibula
in articulation (Skl. 10)



Fig. 4 Lateral aspect of Fibula : a, Skl. 10;
b, Skl. 2; c, II 818

respectively. Circumference at the middle of the shaft also shows distinct difference; it is 66.80 mm for males and 53.50 mm for females. In robusticity index females have slightly lower index value. In none of the humeri perforated olecranon fossa or medial supracondylar spar is found.

RADIUS AND ULNA

No complete or well-preserved radii and ulna were available. Very few measurements taken on incomplete bones are given in Collective Table L.

FEMUR

Measurements have been made on only eight femora (five right and three left) which are complete or partially complete, showing no pathological changes. The average maximum length of the male is 510.60 mm and that of the female is 437.0 mm. The platymeric index for the Cemetery R 37 femora are 82.24 and 90.91, for males and females respectively. Robusticity index, which expresses the relation of the dimensions at the diaphysis middle and the length in natural position, is 11.73 for males and 11.83 for females. The circumference at the middle of the shaft is 90.71 mm for males and 80.0 mm for females. Pilastric index is somewhat higher in females (104.00) than males (97.81).

The gluteal ridges and linea aspera of the femora of Skl. 1, Skl. 10, H 794 and H 793 are strongly marked. Trace of hypotrochanteric fossa is exhibited on Skl. H 815. It may be pointed out that the measurement of length in natural position of one femur (Skl. 10) exceeds even the world record noted by Martin (1928 : 1133).

TABLE 7

Femur

Characters	MALES			FEMALES		
	n	Range	Mean	n	Range	Mean
Maximum length	5	467.0 - 545.0	510.60*	1	—	437.0
Length in natural position	5	462.0 - 543.0	507.40	1	—	431.0
Sagittal diameter at middle of diaphysis	7	22.0 - 34.5	28.71	1	—	26.0
Transversal diameter at middle of diaphysis	7	27.0 - 32.5	29.36	1	—	25.0
Circumference of the shaft at the middle	7	79.0 - 100.0	90.71	1	—	80.0
Length-thickness index	5	17.10 - 19.96	18.12	1	—	18.56
Robusticity index	5	10.68 - 13.04	11.73	1	—	11.83
Pilastric index	7	78.57 - 117.54	97.81	1	—	104.00
Platymeric index	7	77.42 - 90.91	82.24	1	—	90.91

* In calculating mean values, slightly defective maximum length of Skl. H 811 has been excluded.

In all eleven tibia (four right and seven left) of Cemetery R 37 could be measured. Mean maximum length (spino-malleolar) for males is 409.60 mm and for females 379.00 mm. Index of cross-section at the middle of the diaphysis shows higher value for females (76.43) than males (64.81).

TABLE 8

Tibia

Characters	n	MALES			n	FEMALES		
		Range		Mean		Range		Mean
Maximum length (spino-malleolar)	5	374.0	- 460.0	409.60	2	372.0	- 386.0	379.00
Physiological length	7	348.0	- 433.0	377.29	2	352.5	- 364.0	358.25
Sagittal diameter at middle	8	27.0	- 36.0	32.56	3	23.5	- 30.0	25.83
Transversal diameter at middle	8	19.5	- 24.0	21.00	3	19.0	- 20.0	19.50
Minimum circumference of diaphysis	8	64.0	- 88.0	75.69	3	62.0	- 71.0	65.50
Index of cross-section in the middle	8	57.35	- 75.93	64.81	3	65.00	- 85.11	76.43
Robusticity index	5	17.16	- 20.21	18.51	1	—	—	16.71

Only two male fibulae (both left) are intact. Their mean measurements are as follows :

TABLE 9

Fibula

Characters	n	MALES		Mean
		Range		
Maximum length	2	368.0	- 435.0	401.50
Minimum circumference	2	34.0	- 39.0	36.50
Robusticity index	2	8.97	- 9.24	9.10

STATURE AND PROPORTION

For the purposes of comparison of the deviations of the results given by different methods, the living stature was estimated by applying Pearson's, Manouvrier's and Dupertuis & Hadden's formulae basing on measurements of dry long bones. Karl Pearson was a pioneer in applying the statistical method of regression analysis to the prediction of stature from the length of long bones. It is difficult to ascertain as to whose formulae are most suitable for our purpose. Then again, the formulae are based upon researches on materials of countries other than India and, therefore, the estimations made by applying those formulae may not be very accurate with respect to Harappan skeletons. Notwithstanding the criticisms made on the fundamental researches of Manouvrier and Pearson, we have utilized their tables and formulae respectively in addition to a set of 'general formulae' of Dupertuis and Hadden, which is superior to any other designed for a similar purpose and is expected to yield

good approximations to statures of many non-European people (Boyd and Trevor 1953 : 147). Most of the formulae yielding best results are based either on the combination of corresponding bones of upper and lower limbs or two bones of either extremity, which unfortunately were not available in the skeletons of the individuals from Harappa. We had, therefore, mainly the recourse of predicting stature from the length of a single dry long bone or bones of an individual.

It is evident from the Collective Table O, that on the whole Pearson's values are lowest and Dupertuis and Hadden's are highest, those of Manouvrier's standing intermediate. The only exception are with Skl. 10 (male) and H 820 (female), where results obtained using Manouvrier's method give higher figures than Dupertuis and Hadden's.

Of the 103 individuals of Cemetery R 37, stature of only thirteen (eight males and five females) could be estimated from dry long bones which are intact, and display no pathological changes. It is seen that Skl. 1 (male) was the tallest individual not only of Cemetery R 37, but of the whole Harappan population.

Among the males representing Type A the tendency towards tallness is quite apparent. Skl. 1 and Skl. 10 were very tall in stature. Skl. H 794 and H 796 (B) were tall and Skl. H 793 was either above medium or tall. Skl. H 793, whose skull was not available, and hence could not be classified in either of the types, was medium statured. Among the females Skl. H 820 and H 821 were very tall in stature. They too were not diagnosed with respect to the physical features of the two groups. Similar is the case with Skl. H 805(a), who was either above medium or tall. Stature of two females, viz., Skl. H 780 and H 806/A belonging to Type A could be estimated, the former one being either above medium or tall and the latter medium.

Of the Type A skeletons, Skl. H 811 was tall and H 818 was either below medium or medium in stature.

It is observed that there is a distinct difference in mean stature between Type A and Type A₁ males although sample sizes are too small to comment.

	STATURE ACCORDING TO		
	MANOUVRIER	PEARSON	DUPERTUIS AND HADDEN
Type A (M)	1780.25 (5)	1743.84 (5)	1797.06 (5)
Type A ₁ (M)	1684.46 (2)	1665.65 (2)	1711.65 (2)
Type A (F)	1574.12 (2)	1578.4 (1)	1626.6 (1)

The estimated average stature for the males is 1757.1 mm for the males and 1650.6 mm for the females.

For the determination of limb proportions only two skeletons (Nos. Skl. 1 and Skl. 10) could be utilized from Cemetery R 37. The tibiae of Skl. 10 are relatively long with respect to its femora, the tibio-femoral index being dolichocnemic (right 84.01% and left 84.40) according to Turner's (1899) classification. Humero-femoral index could be worked out of Skl. 1 and Skl. 10. In both the cases humeri are proportionately shorter when compared with femora. In case of Skl. 1 humerus is 69.69% of the femur and it is 71.51% in case of Skl. 10.

STATISTICAL CONSTANT : CEMETERY R 37

TABLE 10

ADULT MALE TYPE A

Mean Measurements* and Indices of the Neurocranium

Characters	n	Mean	±	S. E.	Min.	Max.
Max. cranial length	10	188.00	±	1.37	178.00	193.00
Max. cranial breadth	11	133.95	±	0.97	130.00	140.00
Nasion-inion length	9	173.89	±	2.73	157.00	182.50
Basion-bregma height	10	134.05	±	1.59	128.00	145.00
Min. frontal breadth	10	94.60	±	0.89	90.00	97.00
Vertical porion height	9	114.22	±	0.96	110.50	118.50
Median sagittal arc	8	376.12	±	4.37	353.00	395.00
Vertical transversal arc	9	300.56	±	1.66	294.00	309.00
Horizontal circumference	9	521.67	±	3.35	500.00	532.00
Cranial module	10	151.97	±	0.80	148.50	156.17
Calculated cranial capacity	10	1390.24	±	15.00	1335.42	1481.60
Length-breadth index	10	71.24	±	0.82	68.06	75.84
Length-height index	10	71.34	±	1.01	66.84	77.13
Breadth-height index	10	100.19	±	1.26	93.57?	107.41
Length-auricular height index	9	60.80	±	0.79	57.51?	64.40
Breadth-auricular height index	9	85.15	±	0.61	82.14	88.43
Tr. fronto-parietal index	10	70.60	±	0.80	64.98	74.05

TABLE 11

ADULT MALE TYPE A

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S. E.	Min.	Max.
Prosthion-basion line	9	101.28	±	1.08	96.0?	106.0
Nasion-prosthion line	9	70.78	±	1.52	61.0	77.0
Nasion-gnathion line	5	125.70	±	3.29	118.5	135.0
Bizygomatic breadth	5	133.10	±	2.30	125.0	138.0
Nasal height	9	52.28	±	1.09	48.0	58.5
Nasal breadth	8	27.19	±	0.96	22.0	31.0
Ant. inter-orbital breadth	8	19.44	±	0.58	18.0	23.0
Orbital breadth (right)	8	42.38	±	0.63	39.0	44.5
Orbital breadth (left)	9	42.50	±	0.70	40.0	45.5
Orbital height (right)	8	34.00	±	1.12	28.0	37.0

* Measurements followed by query indicate close approximations to the true values, except stated specifically.

TABLE 11 - Continued

Characters	n	Mean	±	S.E.	Min.	Max
Orbital height (left)	9	34.44	±	0.86	30.5	38.0
Maxillo-alveolar length	8	59.31	±	0.74	56.5	63.0
Maxillo-alveolar breadth	7	65.64	±	1.17	61.5	69.0
Palatal length	7	49.57	±	1.43	44.0	55.0
Palatal breadth	7	40.00	±	1.29	35.0	45.0
Total facial index	3	93.60	±	4.35	88.76?	102.27
Superior facial index	5	51.96	±	2.26	44.20	57.20
Orbital index (right)	8	80.33	±	2.82	66.67	92.31
Orbital index (left)	9	81.23	±	2.48	71.43	95.00
Nasal index	8	51.58	±	1.92	41.51	57.94
Maxillo-alveolar index	7	111.67	±	1.67	106.03	118.58
Palatal index	6	79.31	±	3.73	74.00	97.73

TABLE 12

ADULT MALE TYPE A

Mean Indices of the whole Skull

Characters	n	Mean	±	S. E.	Min.	Max.
Tr. cranio-facial index	5	98.70	±	1.60	95.31	102.99
Vert. cranio-facial index	9	52.97	±	1.20	45.19	58.11
Long. cranio-facial index	9	53.90	±	0.68	50.26?	56.74
Jugo-frontal index	5	71.31	±	1.63	68.18	77.60

TABLE 13

ADULT MALE TYPE A

Mean Measurements & Indices of the Mandible

Characters	n	Mean	±	S. E.	Min.	Max.
Bigonial breadth	7	90.79	±	2.92	81.0	101.0
Bicondylar breadth	6	121.75	±	5.22	99.0	135.0
Ht. of mandibular ramus	6	66.33	±	2.00	60.0	74.0
Max. breadth of mandibular ramus	6	45.42	±	1.73	41.0	52.0
Min. breadth of mandibular ramus	7	33.07	±	0.88	30.0	36.0

TABLE 13 - Continued

Characters	n	Mean	±	S.E.	Min.	Max.
Ht. at mandibular symphysis	7	34.93	±	1.49	29.0	40.0
Mandibular length	7	81.00	±	2.09	74.0	90.0
Mandibular angle	6	122.17°	±	2.18	116.5°	128°
Mandibular index	6	68.47	±	4.83	60.38	90.91
Breadth index of mandible	6	75.64	±	2.19	68.94	83.84
Jugo-mandibular index	4	68.78	±	2.98	60.67?	73.72

TABLE 14

ADULT MALE TYPE A

Mean Measurements & Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	±	S. E.	Min.	Max.
Mesiodistal crown diam. of M ₁	6	10.38	±	0.22	9.50	11.00
Labiolingual crown diam. of M ₁	6	11.38	±	0.17	10.75	12.00
Mesiodistal crown diam. of M ₂	7	9.75	±	0.30	8.50	10.50
Labiolingual crown diam. of M ₂	7	11.36	±	0.26	10.50	12.50
Mesiodistal crow diam. of M ₃	5	9.50	±	0.42	8.50	10.50
Labiolingual crown diam. of M ₃	5	10.80	±	0.41	9.50	12.00
Crown index of M ₁	6	109.93	±	2.40	104.76	121.39
Crown index of M ₂	7	117.62	±	4.08	104.88	136.50
Crown index of M ₃	5	114.07	±	2.92	104.76	122.60

TABLE 15

ADULT MALE TYPE A

Mean Measurements & Indices of Permanent Mandibular Molar Teeth

Characters	n	Mean	±	S. E.	Min.	Max.
Mesiodistal crown diam. of M ₁	5	10.15	±	0.31	9.00?	10.75
Labiolingual crown diam. of M ₁	5	10.90	±	0.19	10.50	11.50
Mesiodistal crown diam. of M ₂	4	10.25	±	0.44	9.00	11.00
Labiolingual crown diam. of M ₂	4	10.31	±	0.28	9.50	10.75
Mesiodistal crown diam. of M ₃	5	9.80	±	0.66	8.00	11.75
Labiolingual crown diam. of M ₃	5	9.75	±	0.32	9.00	10.50
Crown index of M ₁	5	107.98	±	5.02	100.00	127.78?
Crown index of M ₂	4	101.28	±	5.70	90.48	116.67
Crown index of M ₃	5	100.92	±	6.00	85.71	118.75

TABLE 16

ADULT MALE TYPE A₁

Mean Measurements & Indices of the Neurocranium

Characters	n	Mean	±	S. E.	Min.	Max.
Max. cranial length	3	186.00	±	1.16	184.0	188.0
Max. cranial breadth	3	131.00	±	0.58	130.0	132.0?
Nasion-inion length	3	173.33	±	1.77	170.0	176.0
Basion-bregma height	2	132.50			129.0	136.0
Min. frontal breadth	2	98.00			97.0	99.0
Vertical porion height	3	117.33	±	0.88	116.0	119.0
Median sagittal arc	3	373.00	±	8.75	356.0	385.0
Vertical transversal arc	1	301.00			—	—
Horizontal circumference	2	512.50			508.0	517.0
Cranial module	2	149.67			148.67	150.67?
Calculated cranial capacity	3	1378.67	±	6.50	1367.30	1389.77?
Length-breadth index	3	70.44	±	0.75	69.15	71.74?
Length-height index	2	71.63			69.35	73.91
Breadth-height index	2	100.75			98.47	103.03?
Length-auricular height index	3	63.09	±	0.79	62.23	64.67
Breadth-auricular height index	3	89.57	±	0.51	88.55	90.15?
Tr. fronto-parietal index	2	74.52			73.48?	75.57

TABLE 17

ADULT MALE TYPE A₁

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S. E.	Min.	Max.
Prosthion-basion line	2	105.50			98.0	113.0
Nasion-prosthion line	3	70.17	±	1.92	68.0	74.0
Nasion-gnathion line	—	—			—	—
Bi-zygomatic breadth	1	122.00			—	—
Nasal height	3	51.00	±	1.73	48.0	54.0
Nasal breadth	3	25.33	±	0.34	25.0	26.0?
Ant. inter-orbital breadth	3	19.33	±	0.88	18.0	21.0
Orbital breadth (right)	3	42.17	±	0.88	40.5	43.5
Orbital breadth (left)	2	41.75			41.5	42.0
Orbital height (right)	3	34.67	±	0.67	34.0	36.0
Orbital height (left)	3	32.33	±	0.60	31.5	33.5
Maxillo-alveolar length	1	63.00			—	—
Maxillo-alveolar breadth	1	63.00			—	—

TABLE 17 - Continued

Characters	n	Mean	±	S.E.	Min.	Max.
Palatal length	3	45.67	±	1.34	43.0	47.0
Palatal breadth	3	38.00	±	1.53	36.0	41.0
Total facial index	—	—			—	—
Superior facial index	1	56.15			—	—
Orbital index (right)	3	82.35	±	3.32	78.16	88.89
Orbital index (left)	2	76.06			75.00	77.11
Nasal index	3	49.75	±	1.19	48.15?	52.08
Maxillo-alveolar index	—	—			—	—
Palatal index	3	83.56	±	5.94	76.60	95.35

TABLE 18

ADULT MALE TYPE A₁

Mean Indices of the whole Skull

Characters	n	Mean	±	S.E.	Min.	Max.
Tr. cranio-facial index	1	93.85			—	—
Vert. cranio-facial index	2	53.56			52.71	54.41
Long. cranio-facial index	2	57.05			52.69	61.41
Jugo-frontal index	—	—			—	—

TABLE 19

ADULT MALE TYPE A₁

Mean Measurements & Indices of the Mandible

Characters	n	Mean	±	S.E.	Min.	Max.
Bigonial breadth	1	97.0			—	—
Bicondylar breadth	1	114.0?			—	—
Ht. of mandibular ramus	1	65.0			—	—
Max. breadth of mandibular ramus	1	39.0?			—	—
Min. breadth of mandibular ramus	2	34.0			31.0	37.0
Ht. at mandibular symphysis	1	26.0			—	—
Mandibular length	2	76.0			74.0	78.0
Mandibular angle	2	119°			118°	120°
Mandibular index	1	64.91			—	—
Breadth index of mandible	1	85.09			—	—
Jugo-mandibular index	1	79.51			—	—

TABLE 20

ADULT MALE TYPE A₁

Mean Measurements & Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	±	S. E.	Min.	Max.
Mesiodistal crown diam. of M ₁	3	10.00	±	0.14	9.75	10.25
Labiolingual crown diam. of M ₁	3	10.67	±	0.44	10.00	11.50
Mesiodistal crown diam. of M ₂	3	10.08	±	0.21	9.75	10.50
Labiolingual crown diam. of M ₂	3	10.67	±	0.44	10.00	11.50
Mesiodistal crow diam. of M ₃	1	7.50			—	—
Labiolingual crown diam. of M ₃	1	10.00			—	—
Crown index of M ₁	3	106.80	±	6.03	97.37	118.02
Crown index of M ₂	3	105.63	±	2.09	102.38	109.52
Crown index of M ₃	1	133.33			—	—

TABLE 21

ADULT MALE TYPE A₁

Mean Measurements & Indices of Permanent Mandibular Molar Teeth

Characters	n	Mean	±	S. E.	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.25			10.00	10.50
Labiolingual crown diam. of M ₁	2	9.62			9.00	10.25
Mesiodistal crown diam. of M ₂	2	9.75			9.50	10.00
Labiolingual crown diam. of M ₂	2	8.25			7.50	9.00
Mesiodistal crown diam. of M ₃	2	9.62			8.75	10.50
Labiolingual crown diam. of M ₃	2	8.25			7.50	9.00
Crown index of M ₁	2	94.20			85.91	102.50
Crown index of M ₂	2	84.58			79.16	90.00
Crown index of M ₃	2	85.74			85.71	85.78

TABLE 22

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Max. cranial length	13	187.54	±	1.09	3.93	2.10	178.0	193.0
Max. cranial breadth	14	133.32	±	0.83	3.11	2.33	130.0	140.0
Nasion-inion length	12	173.75	±	2.05	7.11	4.09	157.0	182.5
Basion-bregma height	12	133.79	±	1.39	4.81	3.60	128.0	145.0

TABLE 22 : C o n t i n u e d

Characters	n	Mean \pm	S. E.	S. D.	C. V.	Min.	Max.
Min. frontal breadth	12	95.17 \pm	0.84	2.89	3.04	90.0	99.0
Vertical porion height	12	115.00 \pm	0.84	2.91	2.53	110.5	119.0
Median sagittal arc	11	375.27 \pm	3.75	12.44	3.31	353.0	395.0
Vertical transversal arc	10	300.60 \pm	1.48	4.69	1.56	294.0	309.0
Horizontal circumference	11	520.00 \pm	2.99	9.93	1.91	500.0	532.0
Cranial module	12	151.58 \pm	0.72	2.49	1.64	148.50	156.17
Calculated cranial capacity	13	1387.57 \pm	11.53	41.61	3.00	1335.42	1481.60
Length-breadth index	13	71.05 \pm	0.65	2.34	3.29	68.06	75.84
Length-height index	12	71.39 \pm	0.88	3.04	4.26	66.84	77.13
Breadth-height index	12	100.28 \pm	1.08	3.74	3.73	93.57	107.41
Length-auricular height index	12	61.37 \pm	0.68	2.36	3.85	57.51?	64.67
Breadth-auricular height index	12	86.26 \pm	0.74	2.57	2.98	82.14	90.15
Tr. fronto-parietal index	12	71.26 \pm	0.80	2.78	3.90	64.98	75.57

TABLE 23

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of the Splanchnocranium

Characters	n	Mean \pm	S. E.	S. D.	C. V.	Min.	Max.
Prosthion-basion line	11	102.05 \pm	1.43	4.76	4.66	96.0?	113.0
Nasion-prosthion line	12	70.62 \pm	1.20	4.15	5.88	61.0	77.0
Nasion-gnathion line	5	125.70 \pm	3.29	7.38	5.87	118.5	135.0
Bizygomatic breadth	6	131.25 \pm	2.64	6.46	4.92	122.0	138.0
Nasal height	12	51.96 \pm	0.90	3.11	5.99	48.0	58.5
Nasal breadth	11	26.68 \pm	0.74	2.45	9.18	22.0	31.0
Ant. inter-orbital breadth	11	19.41 \pm	0.46	1.53	7.88	18.0	23.0
Orbital breadth (right)	11	42.32 \pm	0.50	1.65	3.90	39.0	44.5
Orbital breadth (left)	11	42.36 \pm	0.57	1.90	4.49	40.0	45.5
Orbital height (right)	11	34.18 \pm	0.82	2.73	7.99	28.0	37.0
Orbital height (left)	12	33.92 \pm	0.70	2.43	7.16	30.5	38.0
Maxillo-alveolar length	9	59.72 \pm	0.77	2.31	3.87	56.5	63.0
Maxillo-alveolar breadth	8	65.31 \pm	1.06	3.01	4.61	61.5	69.0
Palatal length	10	48.4 \pm	1.20	3.78	7.81	43.0	55.0
Palatal breadth	10	39.4 \pm	1.01	3.20	8.12	35.0	45.0
Total facial index	3	93.60 \pm	4.35	7.52	8.03	88.76?	102.27
Superior facial index	6	52.66 \pm	1.98	4.84	9.19	44.20	57.20
Orbital index (right)	11	80.88 \pm	2.18	7.23	8.94	66.67	92.31
Orbital index (left)	11	80.29 \pm	2.11	7.00	8.72	71.43	95.00
Nasal index	11	51.08 \pm	1.42	4.71	9.22	41.51	57.94
Maxillo-alveolar index	7	111.67 \pm	1.67	4.43	3.97	106.03	118.58
Palatal index	9	80.72 \pm	3.04	9.11	11.29	74.00	97.73

TABLE 24
ADULT MALE COMBINED
Statistical Constants of the Indices of the Whole Skull

Characters	n	Mean \pm	S. E.	S. D.	C. V.	Min.	Max.
Tr. cranio-facial index	6	97.89 \pm	1.54	3.77	3.85	93.85	102.99
Vert. cranio-facial index	11	53.08 \pm	0.98	3.24	6.10	45.19	58.11
Long. cranio-facial index	11	54.47 \pm	0.89	2.96	5.43	50.26?	61.41
Jugo-frontal index	5	71.31 \pm	1.63	3.65	5.12	68.18	77.60

TABLE 25
ADULT MALE COMBINED
Statistical Constants of the Mandibular Measurements and Indices

Characters	n	Mean \pm	S. E.	S. D.	C. V.	Min.	Max.
Bigonial breadth	11	89.14 \pm	3.52	11.70	13.13	60.0	101.0
Bicondylar breadth	7	103.93 \pm	3.14	8.31	8.00	99.0	135.0
Ht. of mandibular ramus	8	68.38 \pm	2.67	7.56	11.06	60.0	84.0
Max. breadth of mandibular ramus	8	45.31 \pm	1.70	4.82	10.64	39.0	52.0
Min. breadth of mandibular ramus	13	34.27 \pm	0.89	3.21	9.37	30.0	39.0
Ht. at mandibular symphysis	11	33.50 \pm	1.40	4.66	13.91	26.0	40.0
Mandibular length	12	81.92 \pm	1.78	6.16	7.52	74.0	81.0
Mandibular angle	9	120.22 \pm	1.89	5.66	4.71	111.0	125.0
Mandibular index	7	67.96 \pm	4.11	10.88	16.01	60.38	71.11
Breadth index of mandible	7	76.99 \pm	2.28	6.05	7.86	68.94	81.29
Jugo-mandibular index	6	69.74 \pm	2.83	6.93	9.94	60.5	71.11

TABLE 26
ADULT MALE COMBINED
Statistical Constants of the Measurements and Indices
of Permanent Maxillary Molar Teeth

Characters	n	Mean \pm	S. E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	9	10.25 \pm	0.16	0.49	4.78	9.5	10.5
Labiolingual crown diam. of M ₁	9	11.14 \pm	0.21	0.62	5.57	10.5	11.5
Mesiodistal crown diam. of M ₂	10	9.85 \pm	0.22	0.69	7.01	9.0	10.5
Labiolingual crown diam. of M ₂	10	11.15 \pm	0.23	0.73	6.54	10.5	11.5
Mesiodistal crown diam. of M ₃	6	9.17 \pm	0.48	1.17	12.75	8.0	10.5
Labiolingual crown diam. of M ₃	6	10.67 \pm	0.36	0.88	8.24	10.0	11.5
Crown index of M ₁	9	108.88 \pm	2.39	7.57	6.96	100.0	115.0
Crown index of M ₂	10	114.02 \pm	3.39	10.77	9.44	105.0	120.0
Crown index of M ₃	6	117.28 \pm	4.00	12.57	10.72	105.0	125.0

TABLE 27

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices
of Permanent Mandibular Molar Teeth

Characters	n	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	8	10.28	±	0.22	0.62	6.03	9.00	11.00
Labiolingual crown diam. of M ₁	8	10.50	±	0.26	0.74	7.05	9.00	11.50
Mesiodistal crown diam. of M ₂	8	10.12	±	0.23	0.64	6.32	9.00	11.00
Labiolingual crown diam. of M ₂	8	9.59	±	0.39	1.09	11.37	9.00	10.75
Mesiodistal crown diam. of M ₃	9	9.78	±	0.38	1.14	11.66	8.00	11.75
Labiolingual crown diam. of M ₃	9	9.33	±	0.30	0.89	9.54	7.50	10.50
Crown index of M ₁	8	102.69	±	4.26	12.06	11.74	85.91	127.78?
Crown index of M ₂	8	95.00	±	4.08	11.55	12.16	79.16	116.67
Crown index of M ₃	9	95.41	±	3.90	11.71	12.27	85.71	118.75

TABLE 28

ADULT FEMALE TYPE A

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S. E.	Min.	Max.
Max. cranial length	8	179.38	±	2.90	167.0	195.0
Max. cranial breadth	6	131.42	±	2.21	125.0?	139.0
Nasion-inion length	7	170.36	±	2.68	157.0	181.0
Basion-bregma height	5	126.60	±	1.21	124.0	131.0
Min. frontal breadth	8	94.75	±	1.06	91.0	100.0
Vertical porion height	7	111.14	±	1.66	106.0?	120.0
Median sagittal arc	6	359.50	±	3.69	346.0	372.0
Vertical transversal arc	7	300.71	±	5.08	289.0	325.0
Horizontal circumference	7	502.00	±	5.02	483.0	528.0
Cranial module	4	145.46	±	1.10	143.50	148.33
Calculated cranial capacity	6	1289.49	±	56.18	1174.23	1542.89
Length-breadth index	6	73.02	±	1.33	68.68?	77.84
Length-height index	5	70.27	±	0.87	68.68	73.60
Breadth-height index	4	97.69	±	1.97	92.70	101.55
Length-auricular height index	7	61.64	±	0.73	59.55?	65.27
Breadth-auricular height index	6	84.68	±	0.93	81.75	87.20?
Tr. fronto-parietal index	6	72.17	±	1.86	66.91	80.00

TABLE 29

ADULT FEMALE TYPE A

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S. E.	Min.	Max.
Prosthion-basion line	4	93.62	±	3.32	85.0	101.0
Nasion-prosthion line	10	66.45	±	0.97	63.0	72.0
Nasion-gnathion line	3	111.67	±	4.18	107.0	120.0
Bizygomatic breadth	3	125.33	±	2.19	121.0	128.0
Nasal height	10	48.30	±	0.73	45.0	53.0
Nasal breadth	10	24.55	±	0.46	23.0	27.0
Ant. inter-orbital breadth	8	18.62	±	0.83	15.0?	22.5
Orbital breadth (right)	9	42.06	±	1.06	38.0	46.0
Orbital breadth (left)	7	41.36	±	0.83	37.0	44.0
Orbital height (right)	9	34.06	±	0.92	31.5	39.0
Orbital height (left)	8	33.75	±	0.60	31.5	36.5
Maxillo-alveolar length	8	56.06	±	0.70	53.0	59.0
Maxillo-alveolar breadth	8	61.56	±	0.57	59.0	63.5
Palatal length	8	45.50	±	1.13	41.0	48.0
Palatal breadth	8	40.00	±	0.03	39.0	41.0
Total facial index	1	89.26			—	—
Superior facial index	3	51.61	±	0.42	50.78	52.07
Orbital index (right)	9	81.08	±	1.61	76.09	89.47
Orbital index (left)	7	81.34	±	2.14	76.83	93.24
Nasal index	10	50.96	±	1.32	43.40	56.25
Maxillo-alveolar index	8	109.91	±	1.51	105.36	117.92
Palatal index	8	88.27	±	2.11	83.33	100.00

TABLE 30

ADULT FEMALE TYPE A

Mean Indices of the Whole Skull

Characters	n	Mean	±	S. E.	Min.	Max.
Tr. cranio-facial index	3	97.02	±	1.43	94.16	98.46
Vert. cranio-facial index	5	53.11	±	1.46	50.38	57.60
Long. cranio-facial index	3	50.48	±	2.03	46.70	53.65
Jugo-frontal index	3	74.24	±	1.58	71.09	76.03

TABLE 31
ADULT FEMALE TYPE A
Mean Measurements and Indices of the Mandible

Characters	n	Mean	±	S. E.	Min.	Max.
Bigonial breadth	3	78.67	±	4.92	70.0	87.0
Bicondylar breadth	2	104.00			104.0	104.07
Ht. of mandibular ramus	3	58.50	±	0.76	57.5	60.0
Max. breadth of mandibular ramus	3	39.17	±	1.17	38.0	41.5
Min. breadth of mandibular ramus	3	31.33	±	1.09	30.0	33.5
Ht. at mandibular symphysis	4	31.25	±	2.50	26.0	35.0
Mandibular length	4	75.75	±	2.28	73.0	81.0
Mandibular angle	3	117.83	±	1.17	116°	120°
Mandibular index	2	76.44			75.00	77.887
Breadth index of mandible	2	71.64			67.31	75.967
Jugo-mandibular index	1	57.85			—	—

TABLE 32
ADULT FEMALE TYPE A
Mean Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	±	S. E.	Min.	Max.
Mesiodistal crown diam. of M ₁	7	10.00			10.00	10.00
Labiolingual crown diam. of M ₁	6	10.42	±	0.46	9.00	12.00
Mesiodistal crown diam. of M ₂	7	9.46	±	0.29	8.00	10.50
Labiolingual crown diam. of M ₂	7	9.82	±	0.42	8.00	11.25
Mesiodistal crown diam. of M ₃	6	8.62	±	0.35	7.50	10.00
Labiolingual crown diam. of M ₃	6	8.79	±	0.45	7.25	10.00
Crown index of M ₁	6	104.17	±	4.59	90.00	120.00
Crown index of M ₂	7	104.09	±	2.13	94.74	113.16
Crown index of M ₃	6	101.98	±	2.56	94.12	111.76

TABLE 33
ADULT FEMALE TYPE A
Mean Measurements and Indices of Permanent Mandibular Molar Teeth

Characters	n	Mean	±	S. E.	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.75			10.50	11.00
Labiolingual crown diam. of M ₁	2	10.12			10.00	10.25
Mesiodistal crown diam. of M ₂	3	9.58	±	0.12	9.00	10.25
Labiolingual crown diam. of M ₂	3	9.00	±	0.87	7.50	10.50

TABLE 33 - Continued

Characters	n	Mean	±	S.E.	Min.	Max.
Mesiodistal crown diam. of M ₃	3	8.97	±	0.30	8.50	9.50
Labiolingual crown diam. of M ₃	3	8.33	±	0.88	7.00	10.00
Crown index of M ₁	2	94.44			90.91	97.96
Crown index of M ₂	3	94.01	±	8.53	83.33	110.84
Crown index of M ₃	3	93.24	±	7.38	80.06	105.56

TABLE 34

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Max. cranial length	6	180.08	±	2.53	171.0	186.5
Max. cranial breadth	6	129.92	±	2.19	122.0?	138.0
Nasion-inion length	6	167.17	±	1.66	162.0	174.0
Basion-bregma height	5	128.60	±	1.86	125.0	135.0
Min. frontal breadth	6	91.58	±	0.76	89.0	94.0
Vertical porion height	7	111.36	±	2.03	104.0	119.0
Median sagittal arc	5	374.80	±	5.57	358.0	387.0
Vertical transversal arc	5	308.40	±	3.12	297.0	315.0
Horizontal circumference	5	503.00	±	3.97	491.0	514.0
Cranial module	4	147.33	±	1.28	145.00	150.17
Calculated cranial capacity	6	1281.12	±	39.97	1145.86	1388.02
Length-breadth index	6	72.25	±	1.92	66.30?	80.70
Breadth-height index	4	70.43	±	1.07	68.63	73.37
Breadth-height index	4	100.77	±	2.36	96.90	106.56?
Length-auricular height index	6	62.20	±	1.03	58.70	64.91
Breadth-auricular height index	6	86.26	±	1.67	80.43	90.49
Fr. fronto-parietal index	5	70.65	±	1.87	64.49	75.00?

TABLE 35

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Prosthion-basion line	2	96.00			94.0	98.0
Nasion-prosthion line	3	62.33	±	1.20	60.0	64.0
Bizygomatic breadth	4	124.00	±	1.29	121.0?	127.0
Nasal height	5	48.90	±	1.42	42.0	53.0

TABLE 35 - Continued

Characters	n	Mean	±	S.E.	Min.	Max.
Nasal breadth	5	25.10	±	0.60	24.0	27.0
Ant. inter-orbital breadth	6	18.33	±	1.15	14.0	21.0
Orbital breadth (right)	6	39.25	±	0.89	36.0?	42.0
Orbital breadth (left)	6	40.50	±	0.84	39.0	44.0
Orbital height (right)	6	33.50	±	0.80	31.0	37.0
Orbital height (left)	6	34.25	±	1.12	31.0	38.0
Maxillo-alveolar length	3	51.00	±	2.09	48.0	55.0
Maxillo-alveolar breadth	3	62.50	±	2.29	58.0	65.5
Palatal length	3	42.00	±	0.58	41.0	43.0
Palatal breadth	3	39.33	±	0.67	38.0	40.0
Superior facial index	2	50.81			49.59?	52.03
Orbital index (right)	5	86.42	±	1.84	80.49	91.67?
Orbital index (left)	6	84.49	±	1.36	79.49	88.10
Nasal index	5	51.48*	±	1.72	45.28	55.32
Maxillo-alveolar index	3	122.64	±	2.73	119.09	128.00
Palatal index	3	93.72	±	2.76	88.37	97.56

TABLE 36

ADULT FEMALE TYPE A₁
Mean Indices of the Whole Skull

Characters	n	Mean	±	S.E.	Min.	Max.
Tr. cranio-facial index	3	94.71	±	2.84	89.13	98.43
Vert. cranio-facial index	2	48.23			48.00	48.46
Long. cranio-facial index	1	51.09			—	—
Jugo-frontal index	4	73.42	±	1.28	70.87	76.86?

TABLE 37

ADULT FEMALE TYPE A₁
Mean Measurements and Indices of the Mandible

Characters	n	Mean
Bigonial breadth	1	89.0
Bicondylar breadth	1	117.0
Ht. of mandibular ramus	1	62.0
Max. breadth of mandibular ramus	1	44.0

* Due to depletion of calcium in the alveolar process of maxilla nasal index of H 820 (II) gives an inflated result which has been omitted for consideration of statistical constants.

TABLE 37-Continued

Characters	n	Mean
Min. breadth of mandibular ramus	1	36.0
Ht. at mandibular symphysis	1	31.0
Mandibular length	1	80.0
Mandibular angle	1	120.5°
Mandibular index	1	68.38
Breadth index of mandible	1	76.07
Jugo-mandibular index	1	70.08

TABLE 38

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	Min.	Max
Mesiodistal crown diam. of M ₁	1	10.50	—	—
Labiolingual crown diam. of M ₁	1	11.00	—	—
Mesiodistal crown diam. of M ₂	2	9.88	9.00	10.75
Labiolingual crown diam. of M ₂	2	9.62	8.00	11.25
Mesiodistal crown diam. of M ₃	1	7.00	—	—
Labiolingual crown diam. of M ₃	1	6.50	—	—
Crown index of M ₁	1	104.76	—	—
Crown index of M ₂	2	97.10	88.89	105.32
Crown index of M ₃	1	92.86	—	—

TABLE 39

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S.E.	S.D.	C. V.	Min.	Max.
Max. cranial length	14	179.68	±	1.91	7.16	3.98	167.0	195.0
Max. cranial breadth	12	130.67	±	1.50	5.20	3.98	122.0?	139.0
Nasion-inion length	13	168.88	±	1.63	5.90	3.49	157.0	181.0
Basion-bregma height	10	127.60	±	1.10	3.47	2.72	124.0	135.0
Min. frontal breadth	15	93.10	±	0.80	3.08	3.31	89.0	100.0
Vertical porion height	14	111.25	±	1.26	4.71	4.23	104.0	120.0
Median sagittal arc	11	366.45	±	3.89	12.92	3.53	346.0	387.0

TABLE 39-Continued

Characters	n	Mean	±	S. E.	S. D.	C.V.	Min.	Max.
Vertical transversal arc	12	303.92	±	3.33	11.51	3.79	289.0	325.0
Horizontal circumference	12	502.42	±	3.33	11.52	2.29	483.0	528.0
Cranial module	8	146.40	±	0.86	2.43	1.66	143.50	150.17
Calculated cranial capacity	12	1285.31	±	32.94	113.97	8.87	1145.86	1542.89
Length-breadth index	12	72.64	±	1.12	3.89	5.36	66.30?	80.70
Length-height index	9	70.34	±	0.63	1.90	2.70	68.63	73.60
Breadth-height index	8	99.23	±	1.53	4.34	4.37	92.70	105.56?
Length-auricular height index	13	61.90	±	0.60	2.15	3.47	58.70	65.27
Breadth-auricular height index	12	85.47	±	0.94	3.26	3.81	80.43	90.49
Tr. fronto-parietal index	11	71.48	±	1.28	4.24	5.93	64.49	80.00?

TABLE 40

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S.E.	S.D.	C.V.	Min.	Max.
Prosthion-basion line	6	94.42	±	2.22	5.44	5.76	88.0	101.0
Nasion-prosthion line	14	65.11	±	0.94	3.52	5.41	60.0	72.0
Nasion-gnathion line	3	111.67	±	4.18	7.23	6.47	107.0	120.0
Bizygomatic breadth	7	124.57	±	1.11	2.94	2.36	121.0	128.0
Nasal height	17	47.97	±	0.70	2.89	6.02	42.0	53.0
Nasal breadth	17	24.82	±	0.41	1.70	6.85	22.5	28.5
Ant. inter-orbital breadth	15	18.47	±	0.61	2.37	12.83	14.0	22.5
Orbital breadth (right)	16	40.88	±	0.74	2.98	7.29	36.0?	46.0
Orbital breadth (left)	14	40.75	±	0.58	2.17	5.33	37.0	44.0
Orbital height (right)	16	33.91	±	0.59	2.35	6.93	31.0	39.0
Orbital height (left)	15	33.97	±	0.53	2.06	6.06	31.0	38.0
Maxillo-alveolar length	11	54.68	±	0.99	3.30	6.04	48.0	59.0
Maxillo-alveolar breadth	11	61.82	±	0.68	2.27	3.67	58.0	65.5
Palatal length	11	44.56	±	0.95	3.17	7.11	41.0	48.0
Palatal breadth	11	39.82	±	0.26	0.87	2.18	38.0	41.0
Total facial index	1	89.26			—	—	—	—
Superior facial index	5	51.29	±	0.49	1.09	2.13	49.59?	52.07
Orbital index (right)	15	83.29	±	1.32	5.10	6.12	76.09	91.67?
Orbital index (left)	14	83.27	±	1.33	4.98	5.98	76.83	93.24
Nasal index	17	51.99	±	1.34	5.54	10.66	43.40	67.86
Maxillo alveolar index	11	113.38	±	2.18	7.25	6.39	105.36	128.00
Palatal index	11	89.76	±	1.81	6.00	6.68	83.33	100.00

TABLE 41
ADULT FEMALE COMBINED
Statistical Constants of the Indices of the Whole Skull

Characters	n	Mean	\pm S.E.	S.D.	C.V.	Min.	Max.
Tr. cranio-facial index	6	95.87	\pm 1.51	3.71	3.87	89.13	98.46
Vert. cranio-facial index	7	51.71	\pm 1.35	3.57	6.90	48.00	57.60
Long. cranio-facial index	4	50.64	\pm 1.44	2.89	5.71	46.70	53.65
Jugo-frontal index	7	73.77	\pm 0.92	2.44	3.31	70.87	76.667

TABLE 42
ADULT FEMALE COMBINED
Statistical Constants of the Mandibular Measurements and Indices

Characters	n	Mean	\pm S.E.	S.D.	C.V.	Min.	Max.
Bigonial breadth	6	81.00	\pm 2.82	6.90	8.52	70.0	100.0
Bicondylar breadth	3	108.33	\pm 4.31	7.51	6.93	101.0	117.0
Ht. of mandibular ramus	5	59.00	\pm 0.88	1.97	3.34	57.5	62.0
Max. breadth of mandibular ramus	5	39.90	\pm 1.23	2.75	6.89	34.0	45.0
Min. breadth of mandibular ramus	6	31.50	\pm 1.09	2.63	8.51	24.0	38.0
Ht. at mandibular symphysis	7	30.00	\pm 1.68	4.44	14.83	21.0	40.0
Mandibular length	7	75.00	\pm 2.02	5.35	7.12	65.0	85.0
Mandibular angle	5	118.70	\pm 0.81	1.89	1.59	117.0	120.0
Mandibular index	3	73.75	\pm 2.82	4.87	6.61	65.0	85.0
Breadth index of mandible	3	73.11	\pm 2.91	5.07	6.93	65.0	85.0
Jugo-mandibular index	2	63.96					

TABLE 43
ADULT FEMALE COMBINED
Statistical Constants of the Measurements and Indices
of Permanent Maxillary Molar Teeth

Characters	n	Mean	\pm S.E.	S.D.	C.V.	Min.	Max.
Mesiiodistal crown diam. of M ₁	8	10.00	\pm 0.12	0.30	3.00	9.50	10.50
Labiolingual crown diam. of M ₁	7	10.57	\pm 0.27	0.60	5.67	9.50	11.50
Mesiiodistal crown diam. of M ₂	9	9.78	\pm 0.11	0.25	2.56	9.25	10.25
Labiolingual crown diam. of M ₂	9	9.78	\pm 0.11	0.25	2.56	9.25	10.25
Mesiiodistal crown diam. of M ₃	7	9.29	\pm 0.15	0.35	3.77	8.50	10.00
Labiolingual crown diam. of M ₃	7	9.29	\pm 0.15	0.35	3.77	8.50	10.00
Crown index of M ₁	7	1.12	\pm 0.02	0.05	4.50	1.00	1.25
Crown index of M ₂	9	1.02	\pm 0.02	0.05	4.90	0.90	1.15
Crown index of M ₃	7	1.02	\pm 0.02	0.05	4.90	0.90	1.15

TABLE 44
ADULT FEMALE COMBINED
Statistical Constants of the Measurements and Indices
of Permanent Mandibular Molar Teeth

Characters	n	Mean	±	S.E.	S.D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	3	10.67	±	0.16	0.28	2.62	10.50	11.00
Labiolingual crown diam. of M ₁	3	10.08	±	0.08	0.14	1.39	10.00	10.25
Mesiodistal crown diam. of M ₂	3	9.58	±	0.36	0.63	6.58	9.00	10.25
Labiolingual crown diam. of M ₂	4	9.25	±	0.66	1.32	14.27	7.50	10.50
Mesiodistal crown diam. of M ₃	4	9.19	±	0.34	0.69	7.51	8.50	10.00
Labiolingual crown diam. of M ₃	4	8.50	±	0.64	1.29	15.18	7.00	10.00
Crown index of M ₁	3	94.70	±	2.06	3.56	3.76	90.91	97.96
Crown index of M ₂	3	94.01	±	8.53	14.75	15.69	83.33	110.84
Crown index of M ₃	4	92.43	±	5.28	10.55	11.41	80.06	105.56

AREA G 289

From Area G 289 in Division I, II and III altogether twenty-three skulls and some post-cranial bones were recovered, which were found in a tightly packed condition lying in a narrow trench. The bones lay in a confused mass intermingled with animal bones. These crania represent nine adult males, four adult females, four adults (unsexed) and six children. Not all these skeletons are well preserved to permit study, only a small series of ten adults (seven males and three females) and five children's crania are found in restorable and measureable condition. Adult skulls only have been considered for evaluating the physical characteristics. The adult crania featured in this report may be classified by age and sex as follows.

TABLE 45

SEXWISE AGE DISTRIBUTION OF AREA G SKELETON

AGE	LESS THAN 25 YEARS	25-30 YEARS	30-40 YEARS
MALE	—	II S 18, II S 42, III S 2, III S 22, III S 23, III S 47	I S 11
FEMALE	I S 13, II S 21	II S 5	—

The proportion of males is more than double than that of females. The markedly unusual sex-ratio is apparently fortuitous. The age distribution indicates that all the male individuals were in their prime of life within the age-group of twenty-five to thirty excepting one individual, who was thirty to forty years of age. Of the three females, two were young adults less than twenty-five years, while the remaining one was twenty-five to thirty years of age. Combined sex represents a total of 70% individual within twenty-five to thirty years age-group class. On a close scrutiny of the available skulls it was found that many of them have cut marks, injuries and abrasions (Pl. XXXI Figs. 1-3). Children's crania numbering five only, whose ages range from two to ten years have not been taken into account for determining their physical types. However, their measurements have been incorporated in the Collective Table C. Besides, measurements of a well-preserved mandible, which could not be associated with any of the adult cranium considered here, are recorded in the Collective Table F under the heading 'Remaining Mandibles'. The age of the children's crania are :

III S 1	ca.	4-5 years
III S 4	ca.	5-6 years
I S 1	ca.	6 years
III S 8	ca.	6-7 years
I S 15	ca.	9-10 years.

A. CRANIA

SKL. I S 11 [Figs. 58, 59; Pl. XXXVIII]

The skull is that of an adult male. The age of the individual is about 35 to 40 years, part of the coronal and sagittal suture being ossified. The skull is in a good state of preservation with its mandible. A distinct inclined and transverse cut at the nasal root by some sharp weapon is evidenced. The skull is big with moderate supraorbital ridges, strong mastoids with prominent supramastoid crests and well-developed muscular attachments. Post-auricular distance is nearly equal to pre-auricular. The skull is dolichocranic (L-B Index 71.62) and orthocranic (L-AH Index 61.01). The cranial contour in norma verticalis clearly corresponds with *pentagonoides* outline and is expanded at the parietals. Seen from the side, the forehead is slightly receding and turns to a convex vertex which slopes evenly down to moderately prominent *tuber occipitale*. In norma facialis the face is of medium height and breadth. Orbits appear to be rather low, chamaeconchic (OI 74.42) at right and mesoconchic (OI 79.01) at left. Right zygoma is evenly arched, while left is missing. The nose is of moderate length and falls in the messorrhine class (NI 50.98 ?). The palate is deep and short, the dental arcade being *paraboloid* in shape. All the maxillary teeth excepting left M_3 have erupted and show second-degree wear.

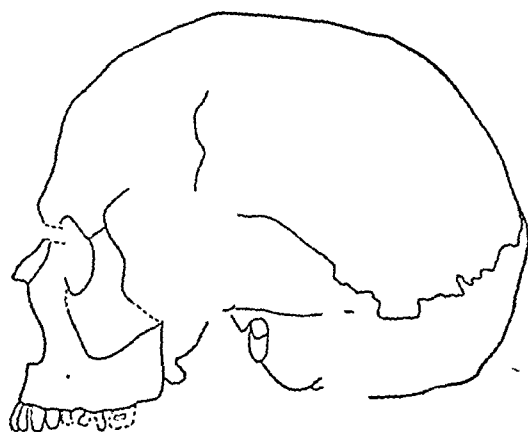


Fig. 58

The mandible is large and complete with all the sixteen teeth intact, and crowns of the teeth show considerable attrition. The bigonial diameter is not very wide (85 mm) and the mandibular angle seems to be evenly rounded. The height of the mandibular ramus is 67 mm and maximum breadth of the ramus measures 47 mm in width—giving a square appearance of the ascending ramus, emphasized by moderately deep incisura or sigmoid notch. Chin is not prominent but rounded, and height at mandibular symphysis is 35 mm.

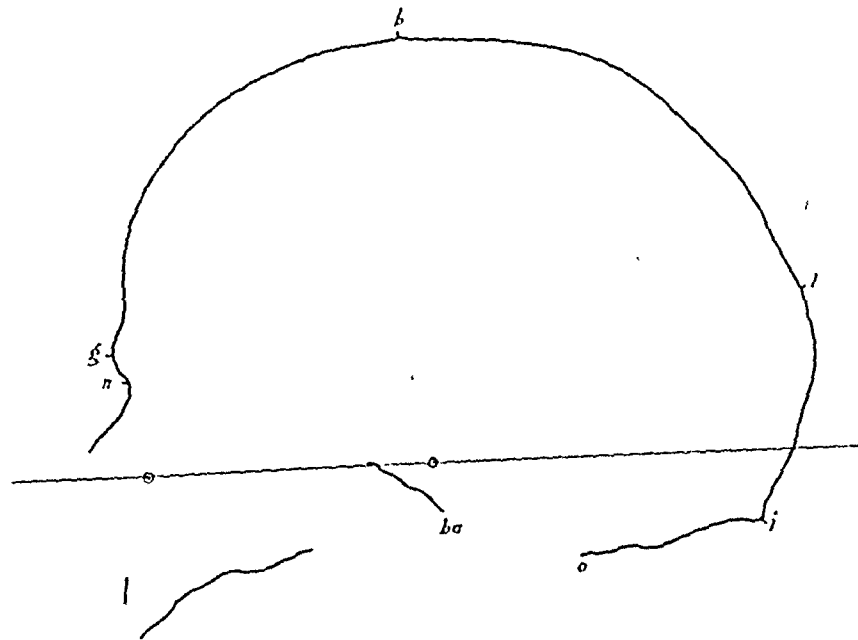


Fig. 59 Skl. I S 11

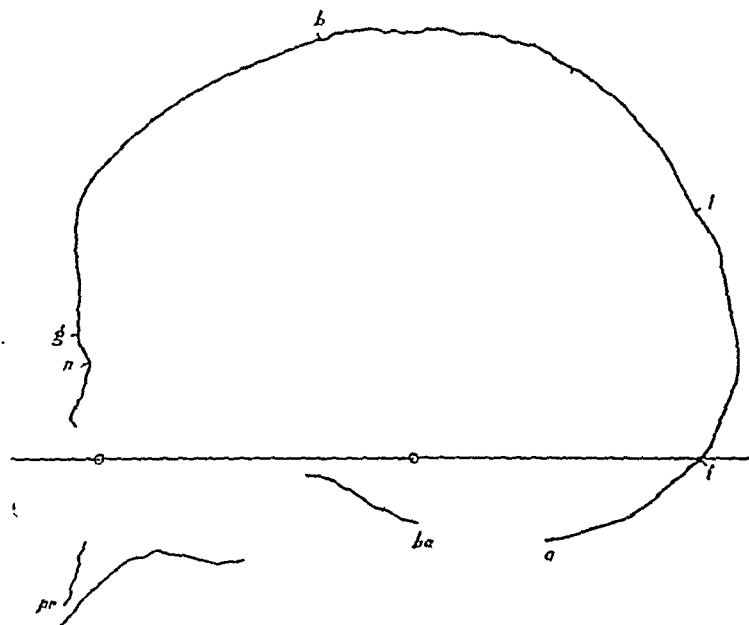


Fig. 60 Skl. II S 18

SKL. II S 18 [Fig. 60; Pl. XXX]

The skull belongs to an adult male. It has a horizontal crack below the infraorbitals. The skull was recovered in an excellent condition. Supraorbital ridges are not marked but big mastoids and medium muscular impressions are exhibited. Left lacrimal groove is deep and wide. None of the cranial sutures is ossified, but the *synchondrosis* sphenobasilaris is united. The skull is subbrachycranic (L-B Index 79.33) and hypsicranic (L-AH Index 64.25). The head shape seen from above is *sphenoides*, being broad in front and expanded at the parietals. Seen from the side, the forehead rises vertically and sweeps backwards into the general contour and merges with the rounded occiput. Post-orbital constriction is absent, the temporal region being well filled. The forehead is wide and the face is medium in height, the superior facial index being mesen (51.56). The orbits are rectangular which slope laterally and downward and fall under chamaeconchic class (right OI 70.24 left OI 66.29). The nose is mesorrhine (NI 49.02). Dentition is well preserved, shows second-degree wear, the arch being evenly *paraboloid* with a deep palate. All the maxillary teeth are in their sockets, excepting two left incisors, the crowns of which are broken. There are signs of caries in the first and second molars on right side as well as second molar on the left side. The calculated cranial capacity is 1401.31 cubic centimeter.

SKL. II S 42 [Figs. 61, 64; Pl. XXXI : 3]

The skull of an adult male. The skull is complete and survived it in good condition excepting for a depressed horizontal fracture on its left temporal region possibly due to injury. Superciliary ridges are moderately developed, mastoid processes of moderate size and the muscular attachments are well

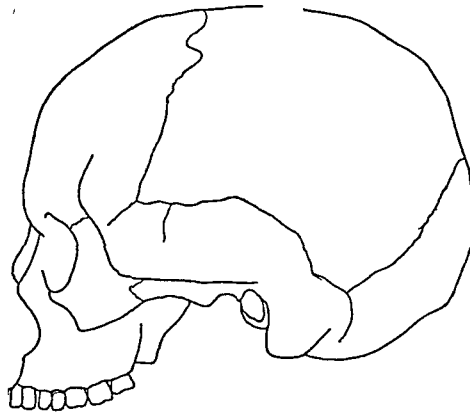
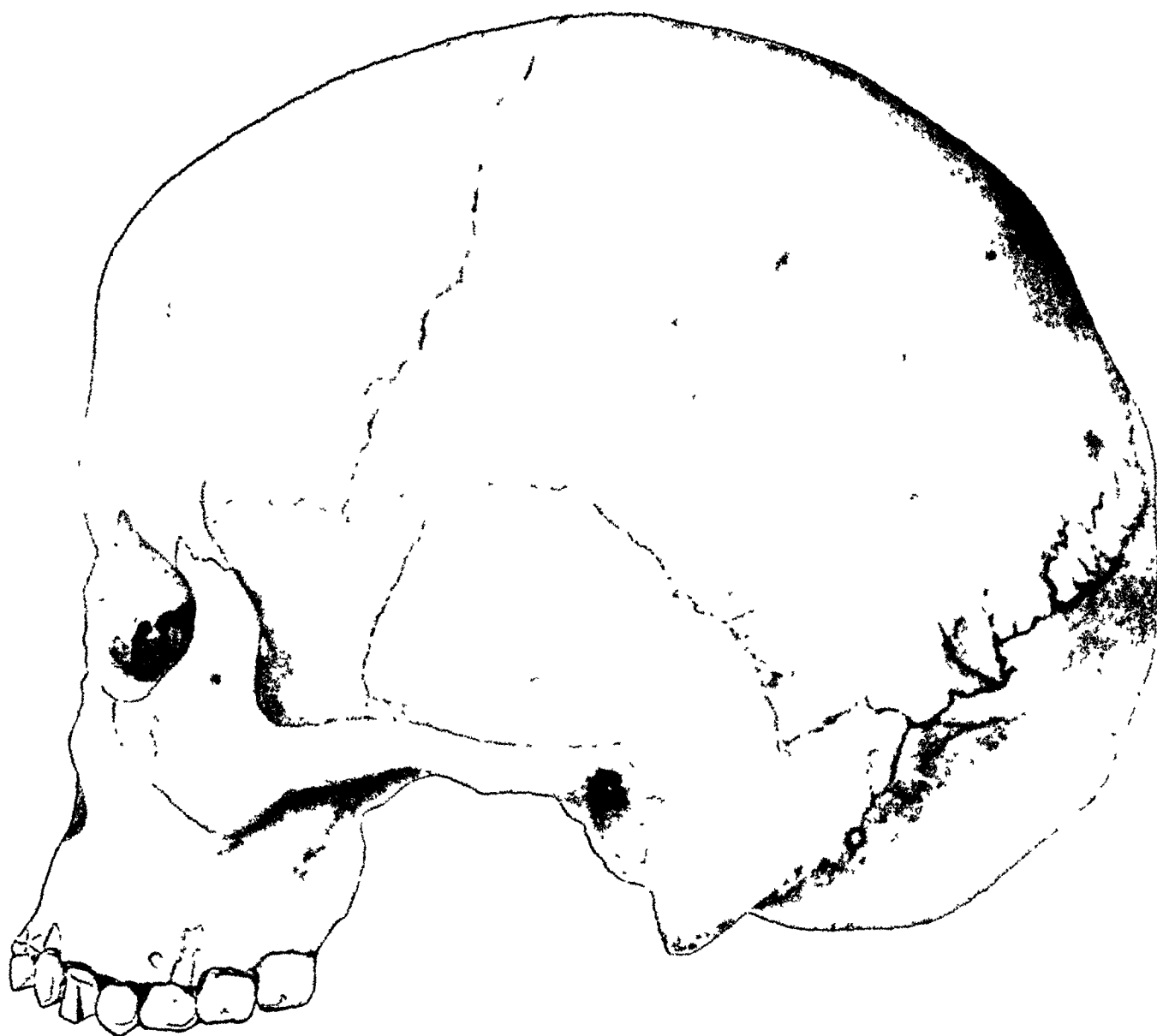


Fig. 61

developed. Vault sutures are open and sphenobasilaris is ossified. The skull is dolichocranic (L-B Index 72.47), and high-vaulted, length-height index hypsicranic (78.37). The vertical portion height of the skull is approximately 116 mm; the measurement could not be considered for indexing as it was taken on the reconstructed vertex region. Norma verticalis is *ovoides* in outline with some degree of bulging at the parietals. Seen from the side, the forehead is vertical and from ophryon it passes backwards into a full curve and merges with the moderately protruding occiput. Forehead is narrow and face moderately narrow. Right zygomatic arch is slender and evenly curved while the left one is missing. Nasal root is narrow, the anterior interorbital space being 17 mm and the nasal depression is shallow. In profile, the bridge of the nose is somewhat straight and prominent, nose-



Norma Lateralis



Fig. 1 Skl. I S 1



Fig. 2 Skl. III S 4

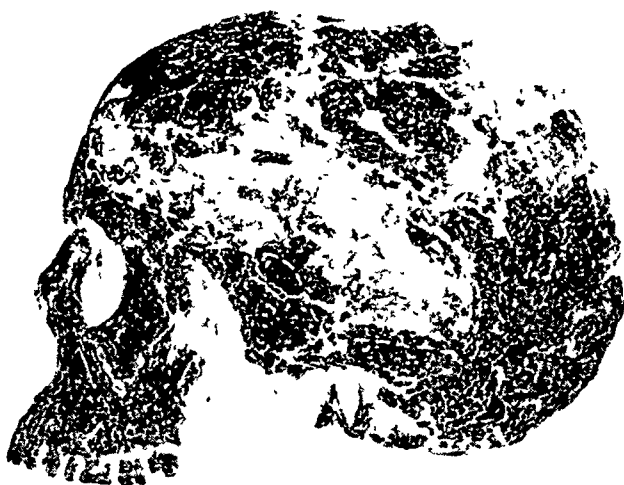


Fig. 3 Skl. II S 42

Figs. 1-3 Showing cranial injuries : Area G.

being mesorrhine (NI 48.54). Subnasal prognathism is present to a slight degree and the meatus lying nearly midway between nasion and lambda. Palate is short, wide and moderately deep; dental arcade is *paraboloid*. All the maxillary teeth are erupted and intact but very much eroded.

SKL. III S 2 [Pl. XL]

The skull is that of an adult male. Supraorbital ridges are slightly developed. Post-mastoid portion of the occiput and contiguous part of the basi cranii are missing. The skull appears to have been subjected to the destructive action of saltpetre. Some scratches are noticed on the wide forehead. In the lambdoid suture two wormian bones are present. Basilar suture is united but the coronal and sagittal sutures are clearly open. The skull is brachycranic (L-B Index 81.29), hypsicranic (L-AH Index 67.25) and metriocranic (B-AH Index 82.73). From the top, contour in norma verticalis resembles with *sphenoides* type, being expanded at the parietals. Zygomatic arch is slightly jutting out from the vertical contour. From the side, the forehead is nearly straight. The orbits tend to be rectangular and are both mesoconchic (right OI 80.00, left OI 77.11). The palate is short, wide, deep and *paraboloid*. The anterior alveolar process of the maxilla is broken.

SKL. III S 22 [Figs. 62, 63; Pl. XXXIX]

The skull is undoubtedly male. Supraorbital ridges are prominent mesially, mastoids being strong with well-developed muscular impressions. None of the cranial sutures is closed but sphenobasilaris is united. These, together with the state of dentition suggest that the skull belongs to an adult individual perhaps 25 to 30 years of age. Abrasions are noticed on the posterior part of both the parietals. Trace of metopic suture is noticed which extends from the nasion to glabella. Greater

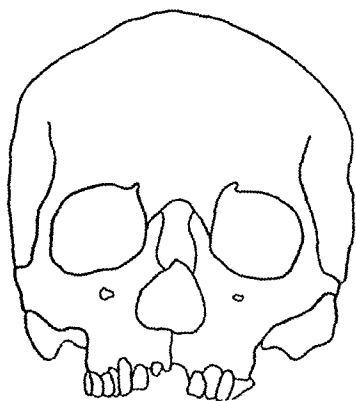


Fig. 62

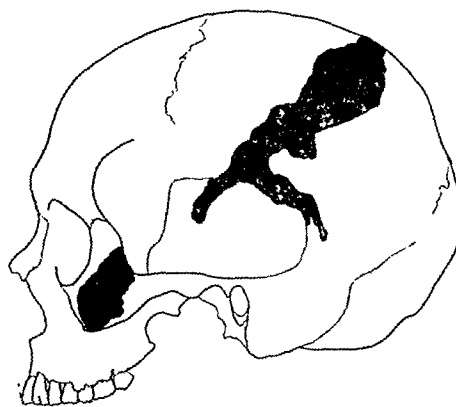


Fig. 63

part of the squama of the occipital bone is missing. Forehead is wide and exhibits some degree of sloping. The skull is subbrachycranic (L-B Index 79.12) and orthocranic (L-AH 59.62). The shape of the head from the top is somewhat *sphenoides* in outline produced by swollen parietals. Face is moderate in height and width falling under mesen (superior facial index 50.05). Pronasial ridge is present and slight degree of subnasal prognathism is observed when viewed from the side. Well-developed incisor fossae are present. The orbits are rectangular, low and medium mesoconchic.

(OI 75.00) at the right, mesoconchic (OI 82.93) at the left. The depression of the nasal root is shallow with a relatively broad interorbital space; in profile the nose is concave. The dental arcade is broad and *paraboloid*. Excepting the incisors all the teeth are in their sockets, which are in very much worn state.

SKL. III S 23 [Pl. IXL : 1 & 2]

The skull is that of an adult male having moderately developed supraorbital ridges above the medial angle of each orbit, large right mastoid with strong supramastoid crests (left mastoid missing) and well-marked muscular impressions. Skull is complete with its mandible. Slight abrasion is noticed on the right frontal. The upper portion of the right half of the squama of the frontal bone is missing. The cusps of the teeth are partially worn. Trace of commencing synostosis on the sagittal suture is observed while coronal is open. Post-auricular development is nearly equal to pre-auricular. The skull is dolichocranic (L-B Index 72.77), orthocranic (L-AH Index 61.26 and L-H Index 72.25). Seen from above, the skull presents a *pentagonoides* shape, the greatest breadth being at the bi-parietals. Seen from the side, the narrow forehead is slightly receding and the occiput moderately projecting. Sagittal curve is full. Depression at the nasal root is shallow; concavo-convex nasal bridge and slight subnasal prognathism are in evidence. The face is longish, the superior facial index being lepten (56.91). The nose is mesorrhine (NI 49.52), the bridge is high pitched, the tip slightly twisted to right and narrow at the root, anterior interorbital space being 17 mm. Orbits are more or less squarish and both are mesoconchic (right OI 82.05 and left OI 77.22). Maxillary teeth are mostly intact. Molars highly abraded (dentine exposed on cusps).

The mandible is of moderate size. The masseteric and pterygoid areas are not strongly marked. The chin is prominent. The minimum breadth of the ascending ramus is 32 mm. The width of the dental arcade measured between the outer margin of the second molar is 62 mm and bigonial breadth is 93 mm. All the mandibular teeth excepting left central incisor are present in sound condition.

SKL. III S 47 [Fig. 65, Pls. XXXII, XXXIII]

Skull is that of an adult male. The age at death appears to have been around 25-30 years. Supraorbital ridges are perceptible above the medial angle of each orbit; mastoids and paramastoids are moderately developed, and the muscular attachments are well marked. Abrasions on the frontal and left parietal region are noticed. Left canine fossa is markedly deep. Closing of sagittal suture at obelion is observed. The skull is subbrachyranic (L-B Index 78.41) and hypsicranic (L-AH Index 65.34). The cranial capacity is 1355.57 cc. Viewed from above, the skull is *byrsoides* in outline with zygomatic arches bowed out laterally to the vertical contour. The vault is well filled at the temporal region. Seen from the side, the forehead is vertical and goes back in an even curve to meet the occiput which is only moderately protruding. The height of the face is less than half of its breadth, the superior facial index is euryen (48.24). The nasal profile is seen to be concave without any depression at the root. Moderate subnasal prognathism is evidenced. The incisors are protruding forwards. The orbits are somewhat squarish in form. Dental arcade is *paraboloid*, narrowed in front.

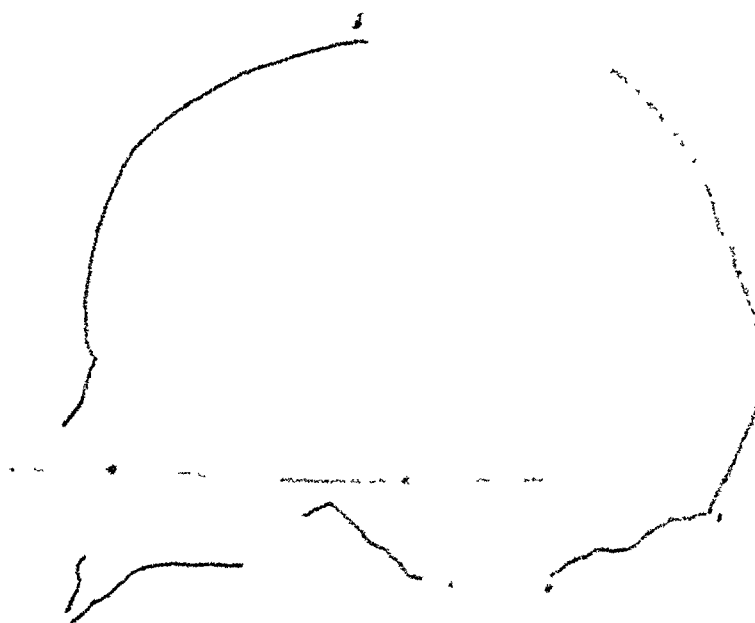


FIGURE 1

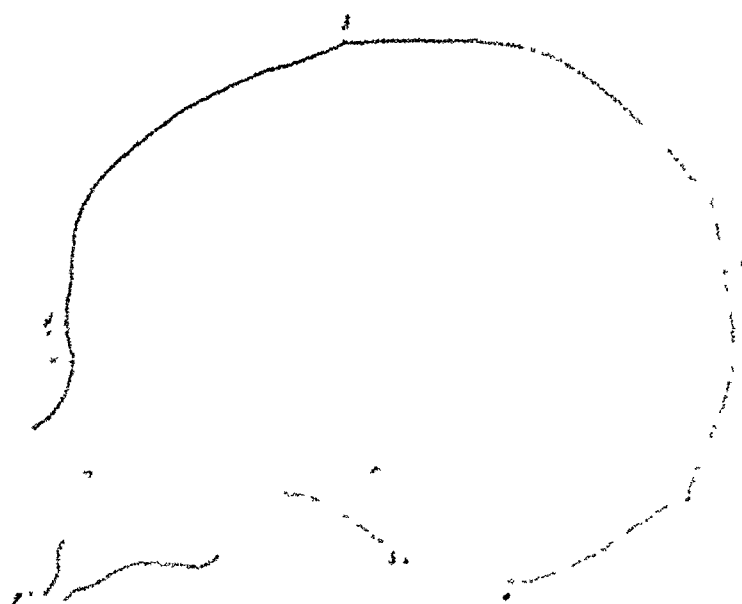


FIGURE 2

(OI 75.00) at the right, mesoconchic (OI 82.93) at the left. The depression of the nasal root is shallow with a relatively broad interorbital space; in profile the nose is concave. The dental arcade is broad and *paraboloid*. Excepting the incisors all the teeth are in their sockets, which are in very much worn state.

SKL. III S 23 [Pl. IXL : 1 & 2]

The skull is that of an adult male having moderately developed supraorbital ridges above the medial angle of each orbit, large right mastoid with strong supramastoid crests (left mastoid missing) and well-marked muscular impressions. Skull is complete with its mandible. Slight abrasion is noticed on the right frontal. The upper portion of the right half of the squama of the frontal bone is missing. The cusps of the teeth are partially worn. Trace of commencing synostosis on the sagittal suture is observed while coronal is open. Post-auricular development is nearly equal to pre-auricular. The skull is dolichocranic (L-B Index 72.77), orthocranic (L-AH Index 61.26 and L-H Index 72.25). Seen from above, the skull presents a *pentagonoides* shape, the greatest breadth being at the bi-parietals. Seen from the side, the narrow forehead is slightly receding and the occiput moderately projecting. Sagittal curve is full. Depression at the nasal root is shallow; concavo-convex nasal bridge and slight subnasal prognathism are in evidence. The face is longish, the superior facial index being lepten (56.91). The nose is mesorrhine (NI 49.52), the bridge is high pitched, the tip slightly twisted to right and narrow at the root, anterior interorbital space being 17 mm. Orbits are more or less squarish and both are mesoconchic (right OI 82.05 and left OI 77.22). Maxillary teeth are mostly intact. Molars highly abraded (dentine exposed on cusps).

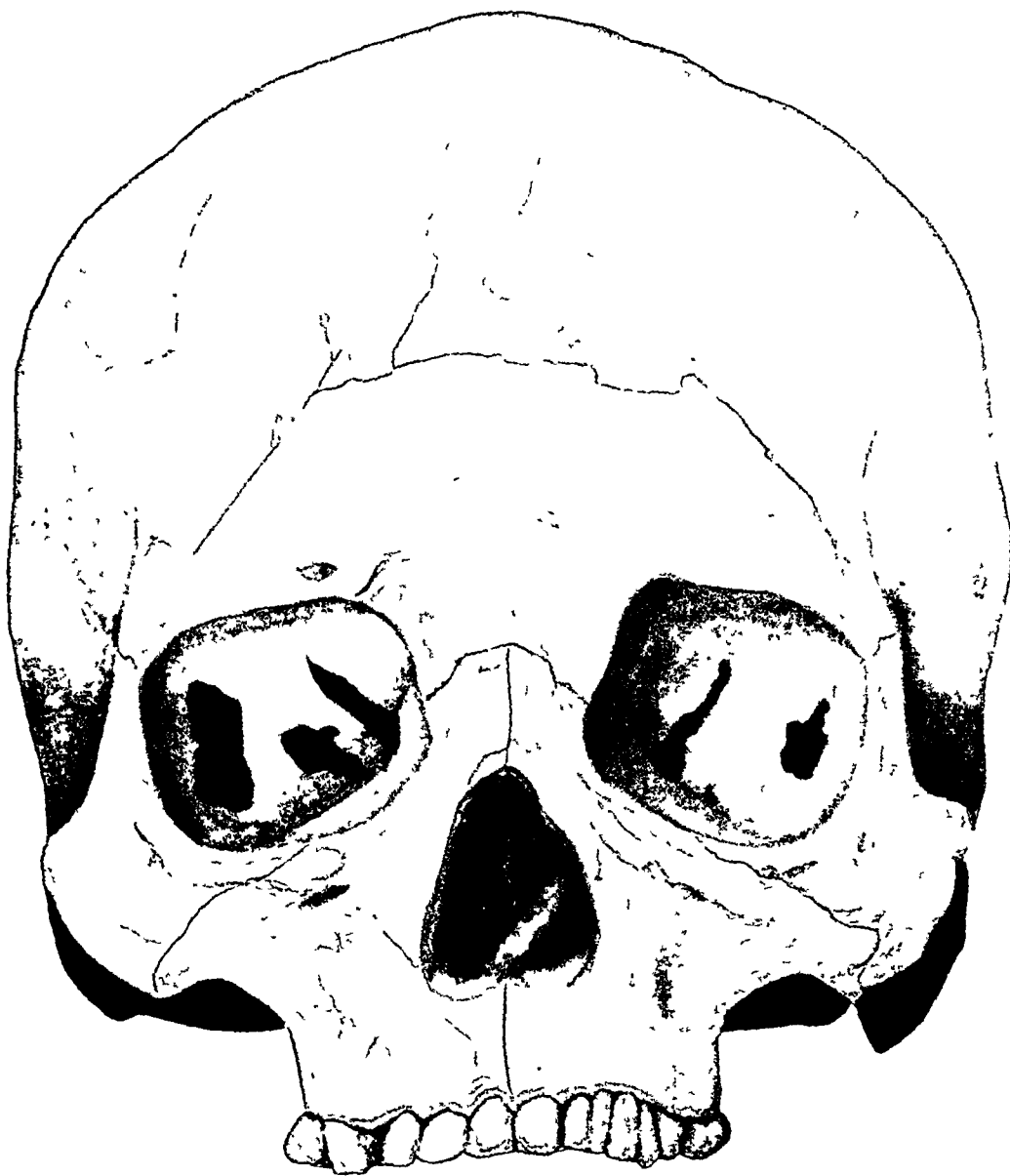
The mandible is of moderate size. The masseteric and pterygoid areas are not strongly marked. The chin is prominent. The minimum breadth of the ascending ramus is 32 mm. The width of the dental arcade measured between the outer margin of the second molar is 62 mm and bigonial breadth is 93 mm. All the mandibular teeth excepting left central incisor are present in sound condition.

SKL. III S 47 [Fig. 65, Pls. XXXII, XXXIII]

Skull is that of an adult male. The age at death appears to have been around 25-30 years. Supraorbital ridges are perceptible above the medial angle of each orbit; mastoids and paramastoids are moderately developed, and the muscular attachments are well marked. Abrasions on the frontal and left parietal region are noticed. Left canine fossa is markedly deep. Closing of sagittal suture at obelion is observed. The skull is subbrachycranic (L-B Index 78.41) and hypsicranic (L-AH Index 65.34). The cranial capacity is 1355.57 cc. Viewed from above, the skull is *byrsoides* in outline with zygomatic arches bowed out laterally to the vertical contour. The vault is well filled at the temporal region. Seen from the side, the forehead is vertical and goes back in an even curve to meet the occiput which is only moderately protruding. The height of the face is less than half of its breadth, the superior facial index is euryen (48.24). The nasal profile is seen to be concave without any depression at the root. Moderate subnasal prognathism is evidenced. The incisors are protruding forwards. The orbits are somewhat squarish in form. Dental arcade is *paraboloid*, narrowed in front.



Norma Lateralis



Norma Frontalis

SKL. I S 13

The skull is that of female adult, probably at the margin of juvenile and adult age. Size is small having ill-marked supraorbital ridges and small mastoids. Superior orbital margins are sharp. Major portion of the cranial vault, specially the entire left side is badly damaged and missing; only the facial portion and the base are present. Incisors protruding forwards and the lateral incisors split vertically. Important measurements, such as head length and head breadth could not be taken. Hence, type-diagnosis of this skull is made on morphological and not on metric grounds. Observed from the top, the fragmentary remnants of the bones present a dolichoid and *ellipsoides* shape. The forehead is vertical while the occiput is rounded. The orbits are somewhat squarish in form and are mesoconchic (right OI 80.00 and left OI 81.69).

SKL. II S 5 [Fig. 66]

The skull of an adult female. Supraorbital ridges are ill developed mesially and both the mastoids are small. Contour of the face and calva is smooth and gracile. Crack mark is observed on both the right and left parietals. Basilar suture is united. The skull is mesocranic (L-B Index 77.14) and orthocranic (L-AH Index 62.86). Cranial contour in norma verticalis is *byrsoides*, narrow in front and expanded at the parietals. Forehead is vertical, well arched and narrow. Occiput is rounded. Face is long and narrow in mid-facial width having slender zygomatic arches. The face is high belonging to the lepten class. The bridge of the nose is straight having a narrow nasal root. Nose is mesorrhine (NI 48.94). The orbits are more or less rectangular and mesoconchic. The palate is moderately deep and *paraboloid*. The cusps of the teeth are not much worn down.

SKL. III S 21 [Fig. 67]

The skull is that of young female. Basilar, sagittal and coronal sutures are open and there is no evidence of beginning union. The supraorbital ridges tended to be poorly developed mesially, mastoids small and muscular attachments undeveloped giving a gracile appearance to the skull. Viewed from top, the skull is *ellipsoides* in shape. The skull is dolichocranic (L-B Index 71.84) and orthocranic (L-AH Index 60.34). Viewed from norma lateralis *sinistra*, forehead appears to be slightly receding, vertex moderately arched and the union of the parietal and occipital bones is marked by a lambdoid depression. There is also evidence of some amount of subnasal prognathism. In norma facialis the face is seen to be moderate in height and breadth and superior facial index is middle (mesen 54.55). Orbits are horizontal and squarish in form. The nasal root is only slightly depressed, ridge short and concave; and nasal aperture is moderately high and broad, mesorrhine (NI 49.48). Norma occipitalis is house-shaped with converging side walls. The shape of the dental arcade is *paraboloid* and somewhat narrow anteriorly. Fourteen maxillary teeth have erupted and there is no indication of the eruption of upper 3rd molars. Tooth wear is not very marked.

ANALYSIS

The skulls with marks of injury, signs of wounds and abrasions in some, found in a tightly packed condition inside a trench at Area G 289, indicate a deliberate and hasty nature of inhumation

unlike any other regular burial. Out of twenty-three crania only 10 well-preserved adult skulls could be considered for attempting diagnosis of physical type. The children's crania numbering five only have been excluded from the present consideration.

The foregoing observations on the adult skulls and their metric data (Collective Table B—C) are quite distinctive for identifying their physical types. Accordingly, two morphological types have been derived, namely, long-headed Type A₁ and round-headed Type B₁. Type-wise and sex-wise distribution of the adult skulls are as follows:

Type A ₁		Type B ₁	
Male	Female	Male	Female
I S 11	I S 13	II S 18	II S 5
II S 42	III S 21	III S 2	
III S 23		III S 22	
		III S 47	

TYPE A₁

In Tables 46-51 the mean values with standard errors, ranges and indices of males of Type A₁ are given; and in Tables 62-65 those of females are given. Photographs and diptograph drawings of two skulls (one male and the other female) representing Type A₁ of Area G are produced in Plates XXXIV, XXXV and in figures 68-70, 71-73.

The essential cranio-facial features of the long-headed Type A₁ are shown below:

MALE			FEMALE	
Length-breadth index	Dolichocranic	(72.29 ± 0.35)	Dolichocranic	(71.84)
Length-height index	Orthocranic	(72.58 ± 3.26)	Orthocranic	(70.69)
Breadth-height index	Acrocranic	(100.37 ± 4.21)	Acrocranic	(98.40)
Length-auricular height index	Orthocranic	(61.14)	Orthocranic	(60.34)
Superior facial index	Lepten	(56.91)	Mesen	(54.55)
Orbital index	Mesoconchic	(79.91 ± 1.59)	Mesoconchic	(83.46 ± 1.55)
Nasal index	Mesorrhine	(49.68 ± 0.71)	Mesorrhine	(49.48)
Palatal index	Brachystaphylin	(87.60 ± 6.39)	Leptostaphylin	(79.17)
Trans. fronto-parietal index	Eurymetopic	(69.02 ± 1.47)	Eurymetopic	(72.00)

It is worthy to note that despite the sex differences in absolute dimensions, there is a close harmony in cranio-facial proportions of Type A₁ skulls. The mean value shows that both male and female are dolichocranic (the skulls representing Type A₁ lie on the cranial index peak of 71-72). The average values for length-height index is 72.58 for males and 70.69 for females. By far the most common occurrence in the Type A₁ skulls is dolicho-ortho-acrocrany.

The mean absolute measurements of both the sexes are as follows: Cranial length 185.83 mm for males and 174.00 mm for females; cranial breadth 134.33 mm for males and 125.00 mm for females; auricular height 116.00 mm for males and 107.00 for females; nasal height 51.67 mm for males and 45.25 mm for females; nasal breadth 25.67 mm for males and 23.75 mm for females. Some of the important morphological characters of both the sexes of Type A₁ are furnished below:

CHARACTERS	TYPE A ₁	
	MALE	FEMALE
Development of supraorbital ridges	Medium	Slight
Slope of the forehead	Slightly receding to Vertical	Slightly receding to Vertical
Depression of the nasal root	Shallow	Shallow
Protuberance of the occipital region	Moderately protruding	Rounded
Mastoid processes	Medium	Small
Nuchal plane	Muscular ridges Medium to Slight	Muscular ridges Slight

The above observations in addition to other traits exhibit some common morphological features of the skulls of both sexes of Type A₁. The skulls of this type are marked by general gracility, medium to slight supraorbital ridges, slightly receding to vertical forehead, medium to narrow face with square and horizontal orbits, medium to narrow nose, shallow nasion depression and projecting occiput.

TYPE B₁

Five skulls, comprising four adult males and one female are attributable to this physical type.

In Tables 52-55 the mean values with standard errors, ranges and indices of males of Type B₁ are given and those of females in Tables 66-69. Photographs and diopograph drawings of two skulls (one male and the other female) representing Type B₁ of Area G are produced in Plates XXXVI, XXXVII and in Figures 74-76, 77-79.

The essential cranio-facial features of the round-headed Type B₁ are given below:

	MALE		FEMALE	
Length-breadth index	Mesocranic	(79.54 ± 0.62)	Mesocranic	(77.14)
Length-height index	Hypsicranic	(75.01 ± 2.08)	Orthocranic	(72.00)
Breadth-height index	Metriocranic	(94.28 ± 1.10)	Metriocranic	(93.33)
Length-auricular height index	Hypsicranic	(64.18 ± 1.56)	Orthocranic	(62.86)
Superior facial index	Euryn	(49.93 ± 0.96)	Lepten	(56.54)
Orbital index	Mesoconchic	(77.50 ± 2.49)	Mesoconchic	(77.60)
Nasal index	Chamaerrhine	(51.46 ± 1.18)	Mesorrhine	(48.94)
Palatal index	Brachystaphylin	(95.70 ± 6.15)	Mesostaphylin	(81.63)
Trans. fronto-parietal index	Eurymetopic	(73.10 ± 1.30)	Metriometopic	(68.15)



Norma Frontalis



Norma Verticalis



Norma Lateralis

Photographs of Type A, Male [Sk. III S 23] of Area G



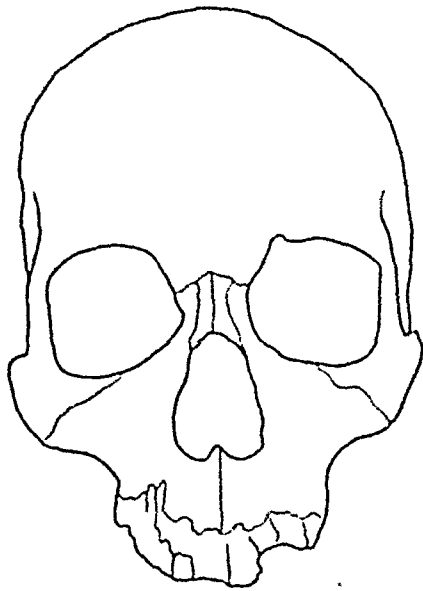
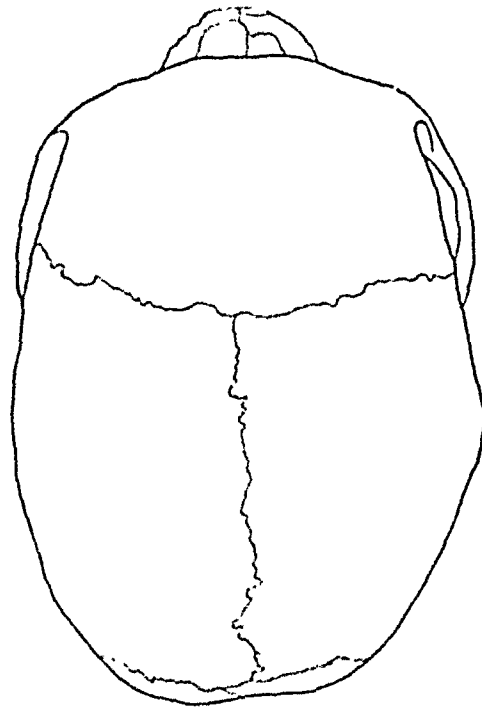
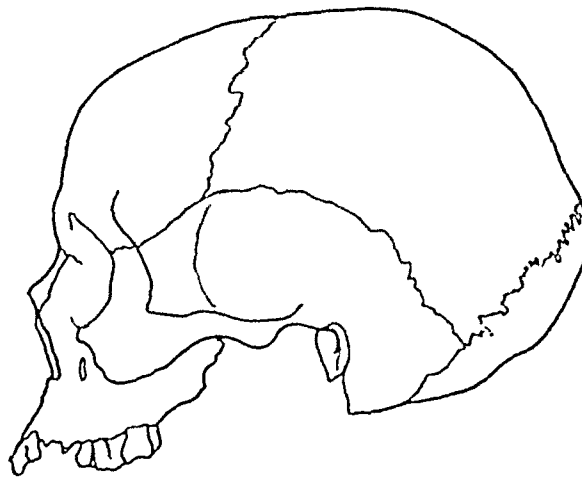
Norma Frontalis



Norma Verticalis



Norma Lateralis

Fig. 71 *Norma Frontalis*Fig. 72 *Norma Verticalis*Fig. 73 *Norma Lateralis*

Figs. 71, 72 and 73. Diophtographic contours of Type A₁ Female [Skl. III S 21] of Area G

Both males and females are mesocranic, the cranial index of the females being slightly higher than the males. The vault is relatively high for males (hypsicranic). In major cranial proportions the Type B₁ skulls are mesocranic or subbrachycranic, ortho- to hypsicranic and metriocranic. With the exception of one skull rest of this series lie on the border of meso- and chamaerrhine with an index around 49-51.

The average values of absolute dimensions of both the sexes belonging to Type B₁ are: Cranial length 177.00 mm for males and 175 mm for females; cranial breadth 140.75 mm for males and 135.00 mm for females; nasal height 50.00 mm for males and 47.00 for female; nasal breadth 25.75 for males and 23.00 for female.

On a close examination of the skulls belonging to Type B₁, the following important morphological features of both the sexes may be tabulated as below:

CHARACTERS	TYPE B ₁	
	MALE	FEMALE
Development of supraorbital ridges	Medium to Slight	Slight
Slope of the forehead	Slightly receding to Vertical	Vertical
Depression of the nasal root	Shallow to Absent	Absent
Protuberance of the occipital region	Moderately protruding to Rounded	Rounded
Contour of the skull from top	Sphenoides	Byrsoides
Zygomatic arch	Phaenozygous and Orthozygous	Orthozygous

Taking into consideration the morphological features of the round-headed skulls certain traits are well delineated. The crania are characterized by having relatively high vault, broad and moderately protruded to rounded occiput, well-filled temporal region, slightly receding to vertical and wide forehead, *byrsoides* and *sphenoides* cranial contour, medium orbits and medium to heavy muscular ridges.

Morphology and cranial proportions of Type B₁ of Area G are in close agreement with the round-headed Alpine type of Hissar III (Krogman 1940 : 22-23).

DISCUSSION

Thus, on the evidence of figures and form two distinct physical types are observed in Area G 289; one is long-headed, designated as Type A₁ and the other is round-headed Type B₁. Type A₁ of

Area G may well be compared with the Type A₁ of Cemetery R 37. The calvarial part of the Type A₁ skull from Area G is long, narrow and moderately high, so that the three cardinal cranial indices (length-breadth, length-height and breadth-height) almost coincide with the mean values of the Type A₁ of Cemetery R 37. At the same time absolute dimensions and indices of the facial part also show close resemblance. Both are long-headed, having smooth and gracile contours, faintly developed glabello-superciliary region ; the entire physical structure being finer and weaker, with medium orbits, mesorrhine nose, medium face with moderate to narrow mid-facial width and protruding occiput. This gracile long-headed Type A₁ population seems to have continued to survive at Area G from the earlier population represented in Cemetery R 37. Thus, Type A₁ of Area G may probably be regarded as the basic type and the survival of the gracile long-headed type (Type A₁) of Cemetery R 37.

Round-headed Type B₁ of Area G is distinct in physical features. The skulls show some well delineated features, having moderately high and full vault, well-filled temporal region, vertical contour varying between *byrsoid* and *sphenoid* with slightly receding to vertical wide forehead and mildly curved occipital bone.

Metrically the Type B₁ skulls shows the following characteristics: On an average it is meso-cranic or low brachycranic, ortho- to hypsicranic, mesoconchic orbit, high mesorrhine to low chamaerrhine. This round-headed population appears to be a new-comer in the scene who had so far, shown no evidence of its presence in the earlier period. The fact, naturally, leads us to postulate that an extraneous group is represented by this round-headed population. Haddon (1919 : 27) held that in ancient times certain unrecorded brachycephalic people migrated in India.

The whole collection of the Area G was discovered in a confused mass in a tightly packed heap unlike any other regular burial, and most of the skulls bear evidences of positive injury. These lead to assume the possibility of a sudden attack by a round-headed invading people on the long-headed autochthones.

B. EXTREMITY BONES

The skeletal materials of Area G, as already noted, were not recovered from regular burials and as such the bones were disarticulated and lay in a disorderly condition. The bones therefore could not be associated with respective skull. All the extremity bones are fragmentary in nature but for one radius (Skl. II S 51) belonging to an adult individual. The scarcity of long bones in good condition baffled all attempts of measurement.

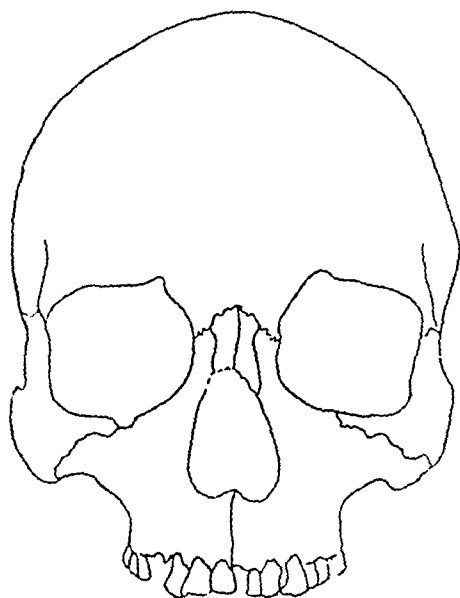


Fig. 74 *Norma Frontalis*

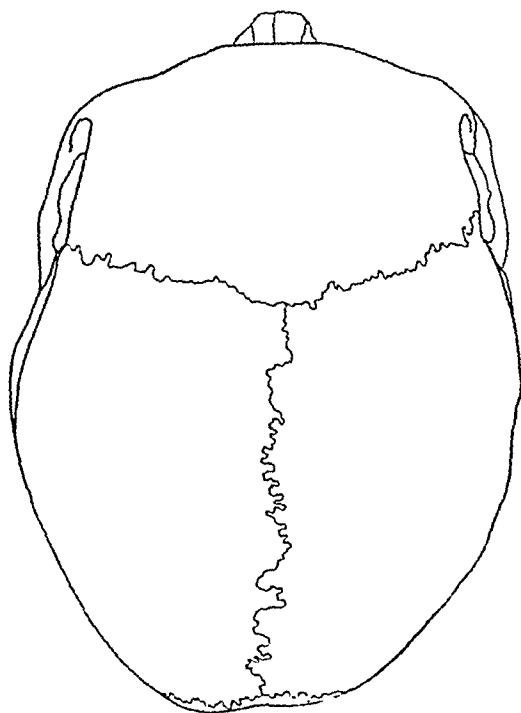


Fig. 75 *Norma Verticalis*

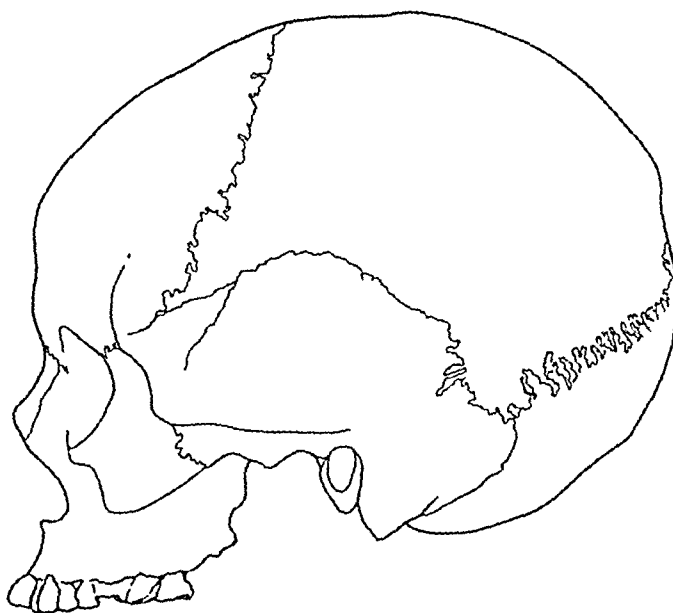


Fig. 76 *Norma Lateralis*

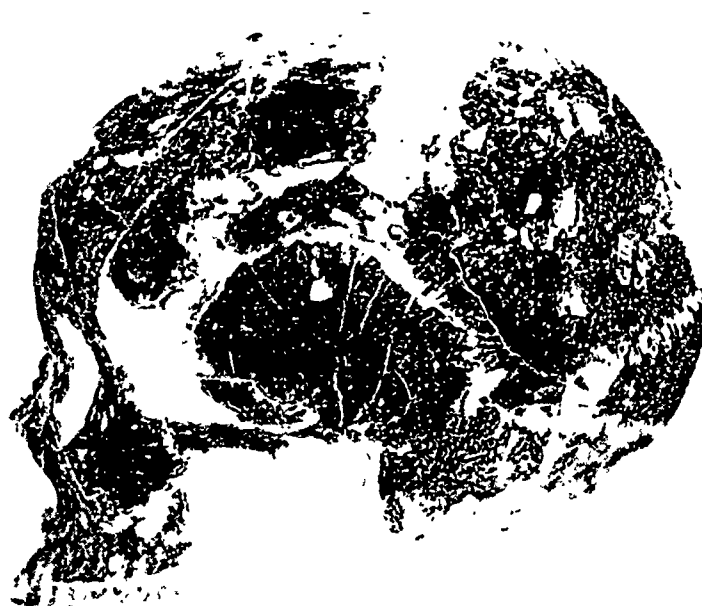
Figs. 74, 75 and 76. Dioptrigraphic contours of Type B₁ Male [Skl. III S 47] of Area G



Norma Frontalis



Norma Verticalis



Norma Lateralis

Photographs of Type B₁ Male [Sk1. III S 47] of Area G



Norma Frontalis



Norma Verticalis



Norma Lateralis

Photographs of Type B Female [SkI, II S 5] of Area G

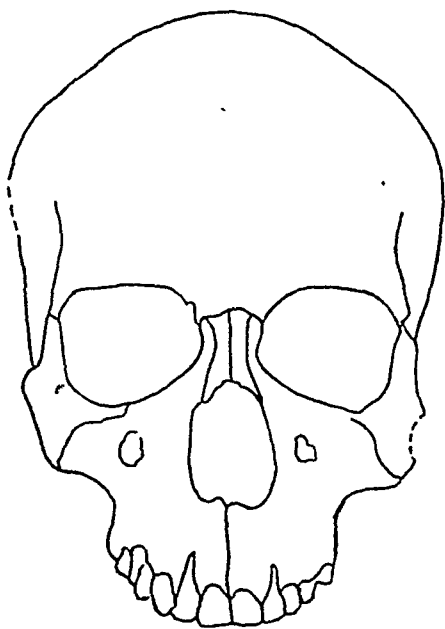


Fig. 77 *Norma Frontalis*

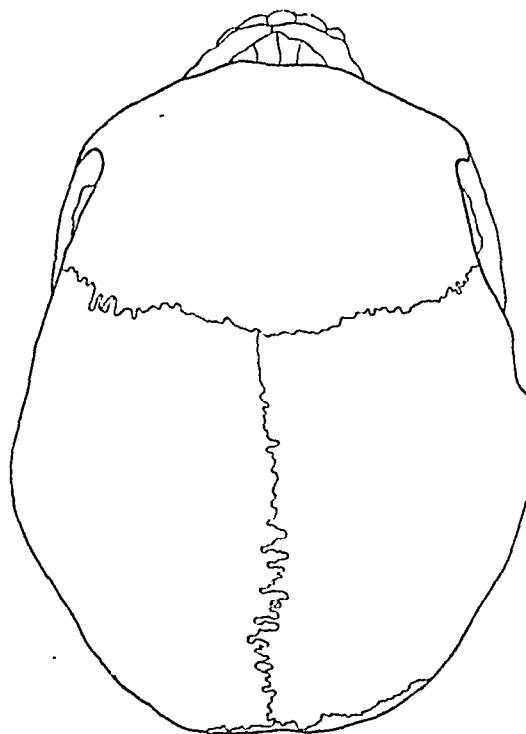


Fig. 78 *Norma Verticalis*

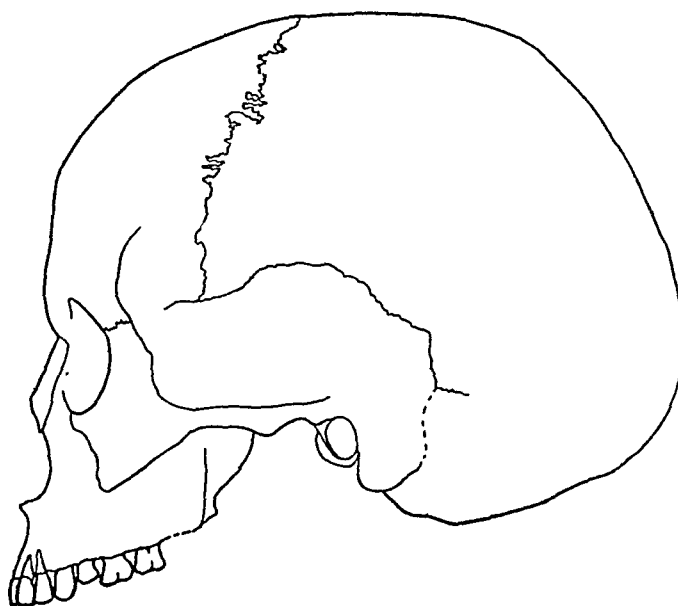


Fig. 79 *Norma Lateralis*

Figs. 77, 78 and 79. Dioptrographic contours of Type B₁ Female (Sk1. II S 5) of Area G

Basic measurements and index of one radius derived from them are shown below :

Skl. II S 51

Maximum length	243.0 mm
Physiological length	233.0 mm
Minimum circumference of diaphysis	38.0 mm
Robusticity index	16.31

As the sex of the individual could not be identified from a single bone, stature has been calculated assuming it to be a male one and a female one separately. The results are shown below :

	ESTIMATED STATURE ACCORDING TO		
	MANOUVRIER	PEARSON	DUPERTUIS AND HADDER FORMULAE
If a male radius	1666.00 mm	1654.10 mm	1726.92 mm
If a female radius	1675.50 mm	1624.59 mm	1717.07 mm

Had the individual happened to be a male one he was tall- or medium-statured, if a female she was very tall or tall.

STATISTICAL CONSTANT : AREA G

TABLE 46

ADULT MALE TYPE A₁

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Max. cranial length	3	185.83	±	3.99	178.0	191.0
Max. cranial breadth	3	134.33	±	2.91	129.0	139.0
Nasion-inion length	3	171.67	±	2.85	166.0	175.0
Basion-bregma height	3	134.67	±	4.11	126.5	139.5
Min. frontal breadth	3	92.67	±	1.77	90.0?	96.0
Vertical porion height	2	116.00			115.0	117.0
Median sagittal arc	3	382.33	±	10.10	363.0	397.0
Vert. transversal arc	3	307.00	±	2.31	303.0	311.0
Horizontal circumference	3	512.67	±	8.88	495.0	523.0
Cranial module	3	151.61	±	2.23	148.83	156.0
Calculated cranial capacity	3	1298.95	±	17.53	1265.39	1324.35
Length-breadth index	3	72.29	±	0.35	71.62	72.77
Length-height index	3	72.58	±	3.26	67.11	78.37
Breadth-height index	3	100.37	±	4.21	93.70	108.14
Length-auricular height index	2	61.14			61.01	61.26
Breadth-auricular height index	2	84.68			84.17	85.19
Tr. fronto-parietal index	3	69.02	±	1.47	66.19	71.11

TABLE 47

ADULT MALE TYPE A₁

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Prosthion-basion line	3	94.50	±	0.76	93.5?	96.0
Nasion-prosthion line	3	68.50	±	1.04	66.5	70.0
Nasion-gnathion line	1	119.00			—	—
Max. bizygomatic breadth	1	123.00			—	—
Nasal height	3	51.67	±	0.44	51.0?	52.5
Nasal breadth	3	25.67	±	0.34	25.0	26.0
Ant. inter-orbital breadth	3	17.33	±	0.34	17.0	18.0
Orbital breadth (right)	3	40.67	±	1.20	39.0	43.0
Orbital breadth (left)	3	39.33	±	0.73	38.0	40.5
Orbital height (right)	3	32.17	±	0.16	32.0	32.5
Orbital height (left)	3	31.67	±	0.60	30.5	32.5
Maxillo-alveolar length	3	53.50	±	2.47	49.0	57.5
Maxillo-alveolar breadth	3	64.67	±	4.42	56.0	70.5

TABLE 47-Continued

Characters	n	Mean	±	S.E.	Min.	Max.
Palatal length	3	49.67	±	1.86	46.0	52.0
Palatal breadth	3	43.33	±	2.34	39.0	47.0
Superior facial index	1	56.91			—	—
Orbital index (right)	3	79.24	±	2.42	74.42	82.05
Orbital index (left)	3	80.59	±	2.53	77.22	85.53
Nasal index	3	49.68	±	0.71	48.54	50.98?
Maxillo-alveolar index	3	121.36	±	9.86	103.70	137.76
Palatal index	3	87.60	±	6.39	75.00	95.65

TABLE 48

Mean Indices of the Whole Skull

ADULT MALE TYPE A₁

Characters	n	Mean	±	S.E.	Min.	Max.
Tr. cranio-facial index	1	88.49			—	—
Vert. cranio-facial index	3	50.98	±	1.99	47.67	54.55?
Long. cranio-facial index	3	50.89	±	0.98	49.60?	52.81
Jugo-frontal index	1	74.80			—	—

TABLE 49

ADULT MALE TYPE A₁

Mean Measurements and Indices of the Mandible

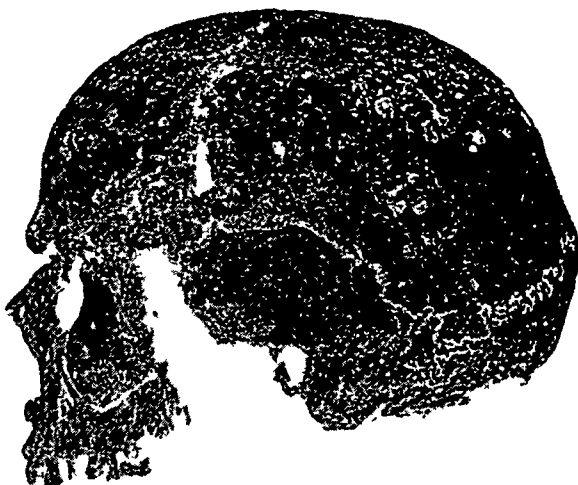
Characters	n	Mean	±	S.E.	Min.	Max.
Bigonial breadth	2	89.00			85.0	93.0
Bicondylar breadth	2	117.50			115.0?	120.0
Ht. of mandibular ramus	2	61.75			56.5	67.0
Max. breadth of mandibular ramus	2	45.25			43.5	47.0
Min. breadth of mandibular ramus	2	34.50			32.0	37.0
Ht. at mandibular symphysis	2	35.00			35.0	35.0
Mandibular length	2	83.25			83.0	83.5
Mandibular angle	2	116.75°			113.5°	120°
Mandibular index	2	70.88			69.58	72.17?
Breadth index of mandible	2	75.85			70.83	80.87?
Jugo-mandibular index	1	75.61			—	—



Frontal view



Vertical view



Left lateral view



Occipital view



Frontal view



Vertical view



Left lateral view

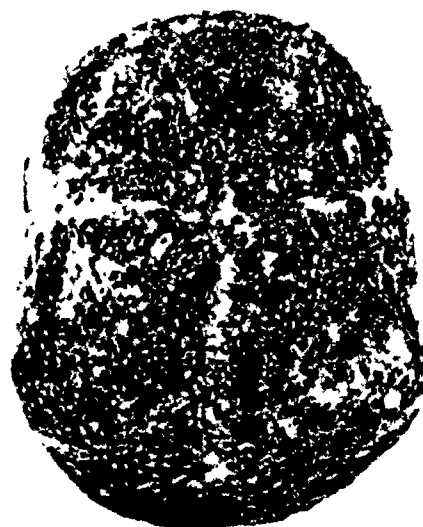


Occipital view

SKL. III S 22 : AREA G



Frontal view



Vertical view



Left lateral view



Fig. 1 Occlusal aspect

Skl.
III 5 23

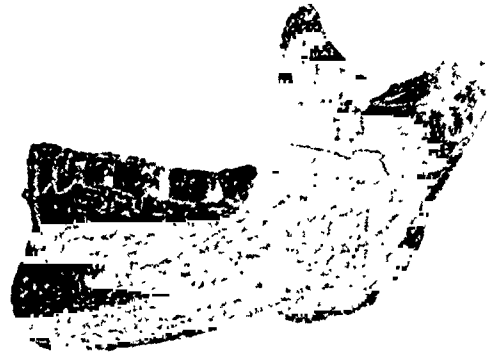


Fig. 2 Left lateral aspect



Fig. 3 Occlusal aspect

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Fig. 4 Left lateral aspect

MANDIBLE : AREA G

TABLE 50

ADULT MALE TYPE A₁

Mean Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	±	S.E.	Min.	Max.
Mesiodistal crown diam. of M ₁	3	10.42	±	0.21	10.00	10.75
Labiolingual crown diam. of M ₁	3	11.25	±	0.14	11.00	11.50
Mesiodistal crown diam. of M ₂	3	10.08	±	0.30	9.50	10.50
Labiolingual crown diam. of M ₂	3	11.67	±	0.51	10.75	12.50
Mesiodistal crown diam. of M ₃	3	9.25	±	0.24	8.75	9.50
Labiolingual crown diam. of M ₃	3	10.92	±	0.65	9.75	12.00
Crown index of M ₁	3	108.26	±	0.87	107.28	110.00
Crown index of M ₂	3	117.79	±	3.62	113.61	125.00
Crown index of M ₃	3	117.85	±	4.42	111.44	126.32

TABLE 51

ADULT MALE TYPE A₁

Mean Measurements and Indices of Permanent Mandibular Molar Teeth

Characters	n	Mean	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.38	10.00	10.75
Labiolingual crown diam. of M ₁	2	11.00	10.00	12.00
Mesiodistal crown diam. of M ₂	2	10.12	9.25	11.00
Labiolingual crown diam. of M ₂	2	10.62	9.25	12.00
Mesiodistal crown diam. of M ₃	2	9.88	9.50	10.25
Labiolingual crown diam. of M ₃	2	9.88	8.50	11.25
Crown index of M ₁	2	106.09	100.00	112.18
Crown index of M ₂	2	104.62	100.15	109.09
Crown index of M ₃	2	99.62	89.47	109.76

TABLE 52

ADULT MALE TYPE B₁

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Max. cranial length	4	177.00	±	2.34	171.0	182.0
Max. cranial breadth	4	140.75	±	1.38	138.0	144.0
Nasion-inion length	4	166.50	±	1.71	162.0	170.0
Basion-bregma height	4	132.62	±	1.95	128.0	137.5

TABLE 52-Continued

Characters	n	Mean	±	S.E.	Min.	Max.
Min. frontal breadth	4	102.88	±	1.74	99.0	106.5
Vertical porion height	4	113.50	±	1.50	109.0	115.0
Median sagittal arc	3	363.00	±	4.73	354.0	370.0
Vert. transversal arc	4	307.00	±	3.39	300.0	315.0
Horizontal circumference	4	512.00	±	4.36	505.0	523.0
Cranial module	4	150.12	±	0.70	148.67	151.33
Calculated cranial capacity	4	1367.34	±	14.38	1334.56	1401.31
Length-breadth index	4	79.54	±	0.62	78.41	81.29
Length-height index	4	75.01	±	2.08	70.33	80.41
Breadth-height index	4	94.28	±	2.10	88.89	98.92
Length-auricular height index	4	64.18	±	1.56	59.89	67.25
Breadth-auricular height index	4	80.68	±	1.74	75.69	83.33
Tr. fronto-parietal index	4	73.10	±	1.30	70.14	75.54

TABLE 53

ADULT MALE TYPE B₁

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Prosthion-basion line	3	95.00	±	2.09	92.0	99.0
Nasion-prosthion line	3	64.67	±	1.59	61.5	66.5
Max. bizygomatic breadth	3	129.50	±	1.76	127.5	133.0
Nasal height	4	50.00	±	1.29	47.0	53.0
Nasal breadth	4	25.75	±	1.11	24.0	29.0
Ant. inter-orbital breadth	4	22.50	±	0.36	21.5	23.0
Orbital breadth (right)	4	41.50	±	0.96	40.0	44.0
Orbital breadth (left)	4	41.50	±	1.14	39.0	44.5
Orbital height (right)	4	31.62	±	0.74	29.5	33.0
Orbital height (left)	4	32.50	±	1.14	29.5	34.5
Maxillo-alveolar length	3	53.33	±	1.36	51.5	56.0
Maxillo-alveolar breadth	3	61.83	±	2.62	57.0	66.0
Palatal length	3	44.33	±	2.34	40.0	48.0
Palatal breadth	4	42.25	±	2.10	38.0	48.0
Superior facial index	3	49.93	±	0.96	48.24	51.56
Orbital index (right)	4	76.31	±	2.34	70.24	80.00
Orbital index (left)	4	78.70	±	4.74	66.29	88.46
Nasal index	4	51.46	±	1.18	49.02	54.72
Maxillo-alveolar index	2	111.14			110.68	111.61
Palatal index	3	95.70	±	6.15	85.42	106.67

TABLE 54
ADULT MALE TYPE B₁
Mean Indices of the Whole Skull

Characters	n	Mean \pm	S.E.	Min.	Max.
Tr. cranio-facial index	3	91.62 \pm	0.75	90.14	92.39
Vert. cranio-facial index	3	49.39 \pm	1.55	46.59	51.95
Long. cranio-facial index	3	53.08 \pm	1.13	51.65	55.31
Jugo-frontal index	3	78.93 \pm	2.20	75.94	83.20

TABLE 55
ADULT MALE TYPE B₁
Mean Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean \pm	S.E.	Min.	Max.
Mesiodistal crown diam. of M ₁	4	10.69 \pm	0.34	10.00	11.50
Labiolingual crown diam. of M ₁	4	11.75 \pm	0.10	11.50	12.00
Mesiodistal crown diam. of M ₂	4	10.00 \pm	0.18	9.50	10.25
Labiolingual crown diam. of M ₂	4	11.06 \pm	0.33	10.50	11.75
Mesiodistal crown diam. of M ₃	4	8.62 \pm	0.24	8.00	9.00
Labiolingual crown diam. of M ₃	4	9.75 \pm	0.36	9.00	10.50
Crown index of M ₁	4	110.36 \pm	4.39	100.00	120.00
Crown index of M ₂	4	111.00 \pm	2.76	103.35	115.07
Crown index of M ₃	4	113.82 \pm	4.08	103.56	123.58

TABLE 56
ADULT MALE COMBINED
Statistical Constants of the Measurements and Indices of the Neurocranium

Characters	n	Mean \pm	S.E.	S.D.	C.V.	Min.	Max.
Max. cranial length	7	180.79 \pm	2.65	7.01	3.88	171.0	191.0
Max. cranial breadth	7	138.00 \pm	1.85	4.90	3.55	129.0	144.0
Nasion-inion length	7	168.71 \pm	1.75	4.64	2.75	162.0	175.0
Basion-bregma height	7	133.50 \pm	1.91	5.07	3.80	126.5	139.5
Min. frontal breadth	7	98.50 \pm	2.35	6.24	6.34	90.07	106.5
Vertical porion height	6	114.33 \pm	1.11	2.73	2.39	109.0	117.0
Longitudinal arc	6	372.67 \pm	6.60	16.16	4.34	354.0	397.0

TABLE 56-Continued

Characters	n	Mean	± S. E.	S. D.	C. V.	Min.	Max.
Vertical transversal arc	7	307.00	± 2.01	5.32	1.73	300.0	315.0
Horizontal circumference	7	512.29	± 4.08	10.81	2.11	495.0	523.0
Cranial module	7	150.76	± 0.97	2.56	1.70	148.67	156.00
Calculated cranial capacity	7	1387.76	± 15.84	41.98	3.03	1334.56	1465.78
Length-breadth index	7	76.43	± 1.51	3.99	5.22	71.62	81.29
Length-height index	7	73.97	± 1.57	4.57	6.18	67.11	80.41
Breadth-height index	7	96.89	± 2.30	6.09	6.29	88.89	108.14
Length-auricular height index	6	63.17	± 1.18	2.88	4.56	59.89	67.25
Breadth-auricular height index	6	82.02	± 1.39	3.41	4.16	75.69	85.19
Tr. fronto-parietal index	7	71.36	± 1.21	3.21	4.50	66.19	75.54

TABLE 57

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of the Splanchnocranium

Characters	n	Mean	± S. E.	S. D.	C. V.	Min.	Max.
Prosthion-basion line	6	94.75	± 1.00	2.44	2.58	92.0	99.0
Nasion-prosthion line	6	66.58	± 1.21	2.96	4.45	61.5	70.0
Nasion-gnathion line	1	119.00		—	—	—	—
Bizygomatic breadth	4	127.88	± 2.04	4.09	3.20	123.0	133.0
Nasal height	7	50.71	± 0.78	2.08	4.10	47.0	53.0
Nasal breadth	7	25.71	± 0.60	1.60	6.22	24.0	29.0
Ant. inter-orbital breadth	7	20.29	± 1.07	2.83	13.95	17.0	23.0
Orbital breadth (right)	7	41.14	± 0.71	1.87	4.55	39.0	44.0
Orbital breadth (left)	7	40.57	± 0.80	2.11	5.20	38.0	44.5
Orbital height (right)	7	31.86	± 0.42	1.11	3.48	29.5	33.0
Orbital height (left)	7	32.14	± 0.67	1.77	5.51	29.5	34.5
Maxillo-alveolar length	6	53.42	± 1.26	3.09	5.78	49.0	57.5
Maxillo-alveolar breadth	6	63.25	± 2.38	5.84	9.23	56.0	70.5
Palatal length	6	47.00	± 1.79	4.38	9.32	40.0	52.0
Palatal breadth	7	42.71	± 1.44	3.82	8.94	38.0	48.0
Superior facial index	4	51.68	± 1.87	3.74	7.24	48.24	56.91
Orbital index (right)	7	77.57	± 1.66	4.39	5.66	70.24	82.05
Orbital index (left)	7	79.51	± 2.73	7.23	9.09	66.29	88.46
Nasal index	7	50.69	± 0.78	2.06	4.06	48.54	54.72
Maxillo-alveolar index	5	117.27	± 5.94	13.30	11.34	103.70	137.76
Palatal index	6	91.65	± 3.98	9.74	10.63	75.00	106.67

TABLE 58

ADULT MALE COMBINED

Statistical Constants of the Indices of Whole Skull

Characters	n	Mean \pm	S. E.	S. D.	C. V.	Min.	Max.
Tr. cranio-facial index	4	90.84 \pm	0.94	1.89	2.08	88.49	92.39
Vert. cranio-facial index	6	50.18 \pm	1.18	2.90	5.78	46.59	54.55?
Long. cranio-facial index	6	51.98 \pm	0.83	2.03	3.91	49.60?	55.31
Jugo-frontal index	4	77.90 \pm	1.86	3.72	4.78	74.80	83.20

TABLE 59

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of the Mandible

Characters	n	Mean \pm	S. E.	S. D.	C. V.	Min.	Max.
Bigonial breadth	3	91.00 \pm	3.06	5.29	5.81	85.0	95.0
Bicondylar breadth	3	119.50 \pm	2.47	4.27	3.57	115.0?	123.5
Ht. of mandibular ramus	4	57.38 \pm	3.89	7.78	13.56	48.0	67.0
Max. breadth of mandibular ramus	4	42.38 \pm	1.82	3.64	8.59	39.0	47.0
Min. breadth of mandibular ramus	6	32.92 \pm	1.20	2.94	8.93	29.5	37.0
Ht. at mandibular symphysis	4	30.62 \pm	3.06	6.13	20.02	22.0	35.0
Mandibular length	5	78.50 \pm	2.73	6.12	7.80	70.0?	83.5
Mandibular angle	3	118.83° \pm	2.81	4.86	4.09	113.5°	123°
Mandibular index	2	70.88	—	—	—	69.58	72.17?
Breadth index of mandible	2	75.85	—	—	—	70.83	80.87?
Jugo-mandibular index	1	75.61	—	—	—	—	—

TABLE 60

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean \pm	S. E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	7	10.57 \pm	0.21	0.55	5.20	10.00	11.5?
Labiolingual crown diam. of M ₁	7	11.54 \pm	0.12	0.33	2.86	11.00	12.0?
Mesiodistal crown diam. of M ₂	7	10.04 \pm	0.15	0.40	3.99	9.50	10.5?
Labiolingual crown diam. of M ₂	7	11.32 \pm	0.29	0.76	6.71	10.5?	12.0?
Mesiodistal crown diam. of M ₃	7	8.89 \pm	0.20	0.54	6.07	8.0?	9.5?
Labiolingual crown diam. of M ₃	7	10.25 \pm	0.39	1.04	10.15	9.0?	11.5?
Crown index of M ₁	7	109.46 \pm	2.40	6.37	5.82	100.0?	115.0?
Crown index of M ₂	7	113.91 \pm	2.43	6.44	5.65	100.0?	125.0?
Crown index of M ₃	7	115.55 \pm	2.86	7.55	6.56	100.0?	130.0?

TABLE 61

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of Permanent Mandibular Molar Teeth

Characters	n	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	5	10.30	±	0.12	0.28	2.72	10.00	10.75
Labiolingual crown diam. of M ₁	5	10.05	±	0.50	1.12	11.14	9.25	12.00
Mesiodistal crown diam. of M ₂	6	9.67	±	0.38	0.94	9.72	8.50	11.00
Labiolingual crown diam. of M ₂	6	9.62	±	0.58	1.41	14.66	8.00	12.00
Mesiodistal crown diam. of M ₃	5	9.75	±	0.31	0.69	7.08	8.75	10.50
Labiolingual crown diam. of M ₃	5	9.25	±	0.67	1.51	16.32	7.25	11.25
Crown index of M ₁	5	97.60	±	3.98	8.92	9.14	90.36	112.18
Crown index of M ₂	6	99.83	±	2.92	7.16	7.17	88.89	109.09
Crown index of M ₃	5	94.47	±	4.42	9.89	10.47	83.01	109.76

TABLE 62

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Max. cranial length	1	174.0			—	—
Max. cranial breadth	1	125.0			—	—
Nasion-inion length	1	157.0			—	—
Basion-bregma height	1	123.0			—	—
Min. frontal breadth	2	88.00			86.0	90.0
Vertical porion height	2	107.00			105.0	109.0?
Median sagittal arc	1	354.0			—	—
Vertical transversal arc	1	277.0			—	—
Horizontal circumference	1	486.0			—	—
Cranial module	1	140.67			—	—
Calculated cranial capacity	1	1139.85			—	—
Length-breadth index	1	71.84			—	—
Length-height index	1	70.69			—	—
Breadth-height index	1	98.40			—	—
Length-auricular height index	1	60.34			—	—
Breadth-auricular height index	1	84.00			—	—
Tr. fronto-parietal index	1	72.00			—	—

TABLE 63

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean \pm S. E.	Min.	Max.
Prosthion-basion line	1	90.50	—	—
Nasion-prosthion line	1	66.00	—	—
Bizygomatic breadth	2	115.50	110.0?	121.0
Nasal height	2	45.25	42.0?	48.5
Nasal breadth	2	23.75	23.5	24.0
Ant. inter-orbital breadth	2	18.50	17.0?	20.0
Orbital breadth (right)	2	37.25	35.0	39.5
Orbital breadth (left)	2	37.50	35.5?	39.5
Orbital height (right)	2	31.00	28.0	34.0
Orbital height (left)	2	31.50	29.0	34.0
Maxillo-alveolar length	1	55.00	—	—
Maxillo-alveolar breadth	2	57.75	57.0	58.5
Palatal length	1	48.00	—	—
Palatal breadth	2	35.00	32.0	34.0
Superior facial index	1	54.55	—	—
Orbital index (right)	2	83.04	80.00	86.08
Orbital index (left)	2	83.88	81.69?	86.08
Nasal index*	1	49.48	—	—
Maxillo-alveolar index	1	106.36	—	—
Palatal index	1	79.17	—	—

TABLE 64

ADULT FEMALE TYPE A₁

Mean Indices of the Whole Skull

Characters	n	Mean \pm S. E.	Min.	Max.
Tr. cranio-facial index	1	96.80	—	—
Vert. cranio-facial index	1	53.66	—	—
Long. cranio-facial index	1	52.01	—	—
Jugo-frontal index	2	76.28	74.38	78.18?

* Due to defective nose, slightly exaggerated value of nasal index of Skl. No. I S 13 has been excluded from consideration.

TABLE 65

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	Min.	Max.
Mesiodistal crown diam. of M ₁	2	9.62	9.25	10.00
Labiolingual crown diam. of M ₁	2	11.00	11.00	11.00
Mesiodistal crown diam. of M ₂	2	9.50	9.00	10.00
Labiolingual crown diam. of M ₂	2	11.25	11.00	11.50
Mesiodistal crown diam. of M ₃	1	8.25	—	—
Labiolingual crown diam. of M ₃	1	12.00	—	—
Crown index of M ₁	2	115.06	111.11	119.00
Crown index of M ₂	2	119.64	111.11	128.17
Crown index of M ₃	1	145.40	—	—

TABLE 66

ADULT FEMALE TYPE B₁

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean
Max. cranial length	1	175.00
Max. cranial breadth	1	135.00
Nasion-inion length	1	160.00
Basion-bregma height	1	126.00
Min. frontal breadth	1	92.00
Vertical porion height	1	110.00
Median sagittal arc	1	372.00
Vertical transversal arc	1	292.00
Horizontal circumference	1	490.00
Cranial module	1	145.33
Calculated cranial capacity	1	1270.89
Length-breadth index	1	77.14
Length-height index	1	72.00
Breadth-height index	1	93.33
Length-auricular height index	1	62.86
Breadth-auricular height index	1	81.48
Tr. fronto-parietal index	1	68.15

TABLE 67

ADULT FEMALE TYPE B₁

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean
Prosthion-basion line	1	93.00
Nasion-prosthion line	1	67.00
Bizygomatic breadth	1	118.50
Nasal height	1	47.00
Nasal breadth	1	23.00
Ant. inter-orbital breadth	1	15.00
Orbital breadth (right)	1	42.00
Orbital breadth (left)	1	40.50
Orbital height (right)	1	32.00
Orbital height (left)	1	32.00
Maxillo-alveolar length	1	58.00
Maxillo-alveolar breadth	1	63.50
Palatal length	1	49.00
Palatal breadth	1	40.00
Superior facial index	1	56.54
Orbital index (right)	1	76.19
Orbital index (left)	1	79.01
Nasal index	1	48.94
Maxillo-alveolar index	1	109.48
Palatal index	1	81.63

TABLE 68

ADULT FEMALE TYPE B₁

Mean Indices of the Whole Skull

Characters	n	Mean
Tr. cranio-facial index	1	87.78
Vert. cranio-facial index	1	53.17
Long. cranio-facial index	1	53.14
Jugo-frontal index	1	77.64

TABLE 69

ADULT FEMALE TYPE B₁

Mean Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₁	1	11.00
Labiolingual crown diam. of M ₁	1	11.75
Mesiodistal crown diam. of M ₂	1	9.75
Labiolingual crown diam. of M ₂	1	11.50
Mesiodistal crown diam. of M ₃	1	10.00
Labiolingual crown diam. of M ₃	1	11.00
Crown index of M ₁	1	106.82
Crown index of M ₂	1	118.16
Crown index of M ₃	1	110.00

TABLE 70

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Max. cranial length	2	174.50			—	—	174.0	175.0
Max. cranial breadth	2	130.00			—	—	125.0	135.0
Nasion-inion length	2	158.50			—	—	157.0	160.0
Basion-bregma height	2	124.50			—	—	123.0	126.0
Min. frontal breadth	3	89.33	± 1.77		3.06	3.43	86.0	92.0
Vertical porion height	3	108.00	± 1.53		2.65	2.45	105.0	110.0
Median sagittal arc	2	363.00			—	—	354.0	372.0
Vertical transversal arc	2	284.50			—	—	277.0	292.0
Horizontal circumference	2	488.00			—	—	486.0	490.0
Cranial module	2	143.00			—	—	140.67	145.33
Calculated cranial capacity	2	1205.37			—	—	1139.85	1270.89
Length-breadth index	2	74.49			—	—	71.84	77.14
Length-height index	2	71.34			—	—	70.69	72.00
Breadth-height index	2	95.86			—	—	93.33	98.40
Length-auricular height index	2	61.60			—	—	60.34	62.86
Breadth-auricular height index	2	82.74			—	—	81.48	84.00
Tr. fronto-parietal index	2	70.08			—	—	68.15	72.00

TABLE 71

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Prosthion-basion line	2	91.75			—	—	90.5	93.0
Nasion-prosthion line	2	66.50			—	—	66.0	67.0
Bizygomatic breadth	3	116.50	±	3.34	5.77	4.95	110.0?	121.0
Nasal height	3	45.83	±	1.97	3.40	7.42	42.0?	48.5
Nasal breadth	3	23.50	±	0.29	0.50	2.13	23.0	24.0
Ant. inter-orbital breadth	3	17.33	±	1.46	2.52	14.54	15.0	20.0
Orbital breadth (right)	3	38.83	±	2.05	3.55	9.14	35.0	42.0
Orbital breadth (left)	3	38.50	±	1.53	2.65	6.88	35.5?	40.5
Orbital height (right)	3	31.33	±	1.77	3.06	9.77	28.0	34.0
Orbital height (left)	3	31.67	±	1.46	2.52	7.96	29.0	34.0
Maxillo-alveolar length	2	56.50			—	—	55.0	58.0
Maxillo-alveolar breadth	3	59.67	±	1.97	3.40	5.70	57.0	63.5
Palatal length	2	48.50			—	—	48.0	49.0
Palatal breadth	3	36.67	±	2.40	4.16	11.34	32.0	40.0
Superior facial index	2	55.54			—	—	54.55	56.54
Orbital index (right)	3	80.76	±	2.88	4.99	6.18	76.19	86.08
Orbital index (left)	3	82.26	±	2.06	3.57	4.34	79.01	86.08
Nasal index	3	51.46	±	2.25	3.90	7.58	48.94	55.95?
Maxillo-alveolar index	2	107.92			—	—	106.36	109.48
Palatal index	2	80.40			—	—	79.17	81.63

TABLE 72

ADULT FEMALE COMBINED

Statistical Constants of the Indices of Whole Skull

Characters	n	Mean	±	S. E.	S. D.	C.V.	Min.	Max.
Tr. cranio-facial index	2	92.29			—	—	87.78	96.80
Vert. cranio-facial index	2	53.42			—	—	53.17	53.66
Long. cranio-facial index	2	52.58			—	—	52.01	53.14
Jugo-frontal index	3	76.73	±	1.19	2.06	2.68	74.38	78.18?

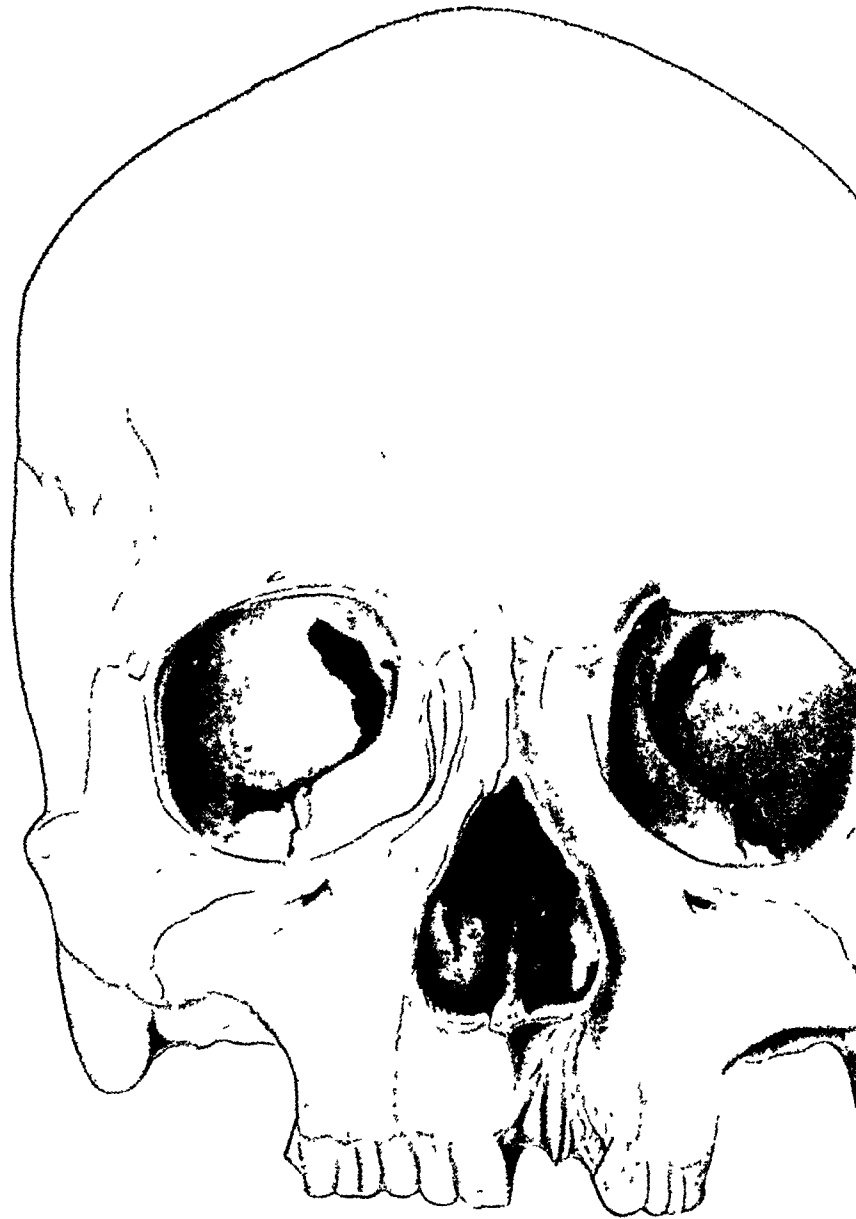
TABLE 73

ADULT FEMALE COMBINED

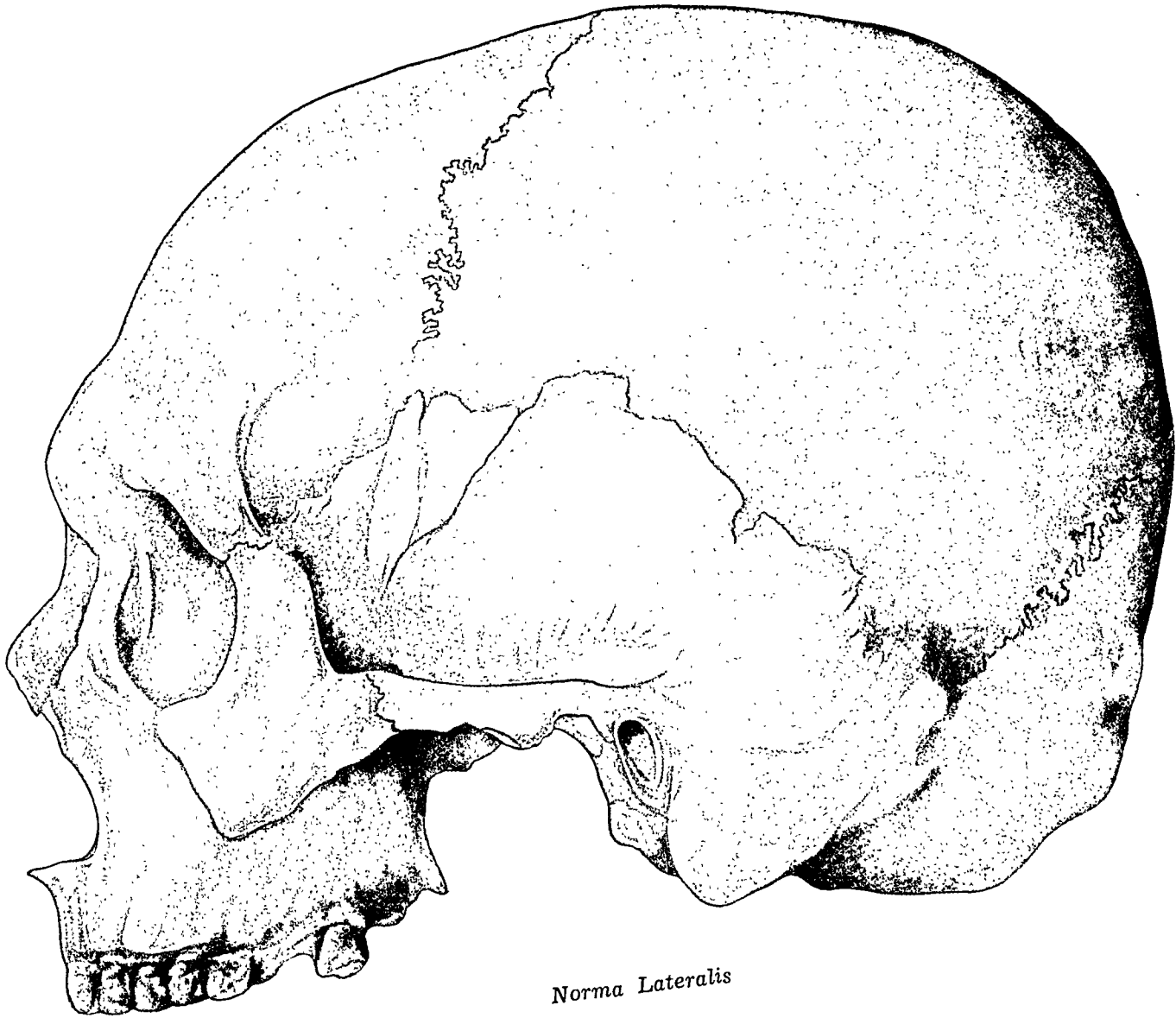
Statistical Constants of the Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean	±	S.E.	S.D.	C. V.	Min.	Max
Mesiodistal crown diam. of M_1	3	10.08	±	0.51	0.88	8.73	9.25	11.00
Labiolingual crown diam. of M_1	3	11.25	±	0.24	0.42	3.73	11.00	11.75
Mesiodistal crown diam. of M_2	3	9.58	±	0.30	0.52	5.43	9.00	10.00
Labiolingual crown diam. of M_2	3	11.33	±	0.16	0.28	2.47	11.00	11.50
Mesiodistal crown diam. of M_3	2	9.12			—	—	8.25	10.00
Labiolingual crown diam. of M_3	2	11.50			—	—	11.00	12.00
Crown index of M_1	3	112.31	±	3.57	6.18	5.50	106.82	119.00
Crown index of M_2	3	119.15	±	4.95	8.57	7.19	111.11	128.17
Crown index of M_3	2	127.70			—	—	110.00	145.40

HUMAN REMAINS FROM HARAPPA
GUPTA, DUTTA & BASU



Norma Frontalis



AREA (MOUND) AB

Mound AB, F and Area J have yielded altogether 25 skeletons mostly represented by incomplete and stray bones. The skeletons comprise of 17 adults, 5 children and 2 infants below 3 years of age. As regards the burials of Mound AB and F, Guha (Vats 1940 : 162) doubts their authenticity as real Harappan and regards as modern graves, on the ground that one skull possesses higher specific gravity as compared to bones of Cemetery H and Area G. Vats (1940 : 162), however, refutes Guha on archaeological evidence and insists that Mound burials are genuinely of Harappan culture.

Out of the adult skeletons represented in the Mound Area, the sex of the 12 adults has been ascertained which shows equal number of males and females (6 males and 6 females).

In order to evaluate the physical types of the Mound Area, only three adult crania from Mound AB comprising one male and two females could be utilized, while the other adults are too fragmentary to be of use in this respect. The measurements of one child's cranium is recorded in Collective Table C, but the determination of its physical type has at present not been attempted.

CRANIA

The measurements and observations of the skulls are incorporated in Collective Table C and I. Detailed descriptive notes on the skulls are given below :

SKL. 11635 [Figs. 80, 81 : Pls. L, LI, LII]

The skull belongs to an adult male between 25 and 30 years of age at death. It is complete with mandible and in an excellent state of preservation. Supraorbital ridges are heavy amounting almost to a *torus orbitalis*. Mastoid processes are large and the muscular impressions at the nuchal region are well marked. Basilar suture is united while coronal, sagittal and lambdoidal sutures are open. Cranial contour in *norma verticalis* is *byrsoides*. The skull is dolichocranic (L-B Index 73.08), high vaulted (low hypsicranic by length-height, acrocranic by breadth-height), and has a mesenic face (upper facial index 51.49), low chamaerrhine nasal aperture (NI 51.43), large mesoconchic orbits and mildly flattened temporal region. Seen from the side, the forehead is low and receding, nose marked by deep nasion depression, somewhat concave nasalia profile, prominent spine and flattened occiput. All the maxillary teeth are intact, excepting for the left incisors which are fallen off. Tooth wear is extreme.

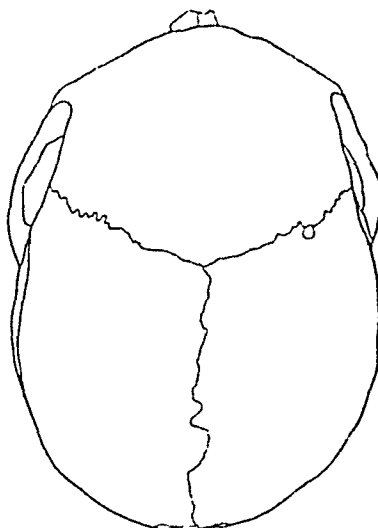


Fig. 80

Mandible is moderately developed with central triangular chin eminence and thick short symphysis (27.5 mm). Corpus is moderate in bulk and ramus moderate in width with high coronoid process. The muscular attachments for the *masseteric* and *pterygoidei interni* are sharply defined. The lower jaw is wide at its angle, the bigonial diameter being 104 mm.

SKL. 5440 D

Between the IIIrd and IVth strata two fragmentary human skulls (Skl. 5440 B and Skl. 5440 C), one lower jaw (No. 5440 A) and some other stray bones were brought to light but no mention was made of the fragmentary human Skl. 5440 D in Vat's Report. One skull bearing number 5440 D has, however, been entered in the field catalogue and available in the collection at our disposal while there is no skull numbering 5440 B.

The skull (No. 5440 D) belongs to an adult female, and appears to be in slightly mineralized condition. The skull is without face and mandible. Mastoid processes are thin and slightly long. The skull is hyperdolichocranic (L-B Index 69.95 ?). Only few measurements could be taken due to the incompleteness of the skull.

Brain cast*: Left half of original brain, transformed into earth retaining its natural shape size and morphology, weighing 505.4 gms (including the shellac coat applied for preservation). The left cerebral hemisphere comprises frontal, temporal, parietal and occipital lobes on superolateral aspect of surface. Medial aspect shows smooth impression of falx cerebri. Below this is the hollowed impression of callosal sulcus, inferior of which the continuity of corpus callosum joining the two cerebral hemispheres is cut off. On the base deep hollow of colateral sulcus is noticed. Gyri smoothed

* Thanks are due to Dr G. S. Mody for his observation on brain cast.

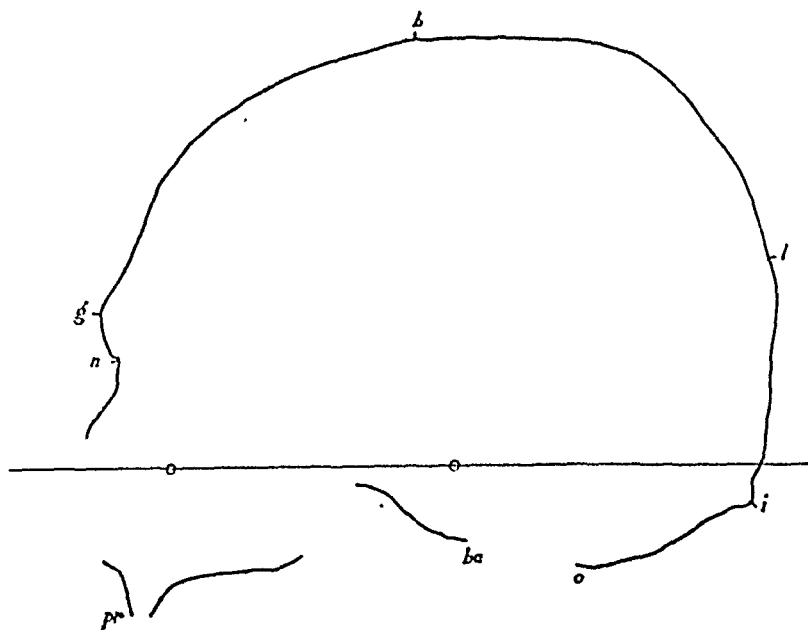


Fig. 81 Skl. 11635

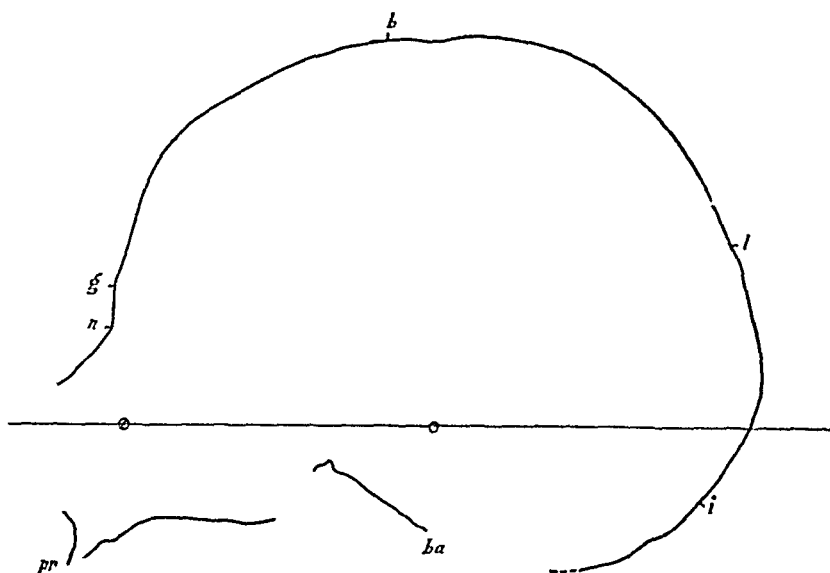


Fig. 82 Skl. Mound AB (Rec.)

MID-SAGITTAL CURVE ($1/2$ NATURAL SIZE)

out except at the base of the frontal lobe. Among sulci fissures of Sylvius and Rolando marked by deep surface. Similar replica of left cerebral hemisphere is artificially and inaccurately joined at the superomedial border with the corresponding right half (Pl. LXXVIII : 3).

SKL. Mound AB (Rec.) [116, 82, 83, 84]

The skull is that of an adult female. Age at death was probably 25 or under. It is comparatively smaller in size and the contours are gracile in nature. The supraorbital ridges are absent and the glabella is only slightly marked. Mastoid processes are moderately small and the muscular impressions at the nuchal region are ill developed. Some abrasion marks are noticed on the forehead. Forehead is very slightly receding and passes upwards and backwards in a uniform high curve. Frontal and parietal eminences are slightly marked. The skull is hyperdolichocranic (L-B Index 69.23) and orthocranic (L-AH Index 60.89). Nose being high pitched, long and narrow is leptorrhine (NI 45.83). The nose is not depressed at the root. The maxillary teeth are represented by a well set of 16 intact teeth of which only the left M_1 is carious.

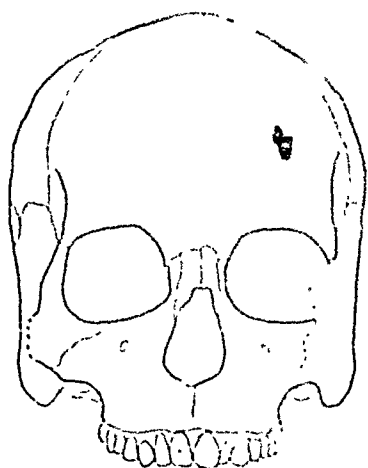


Fig. 83

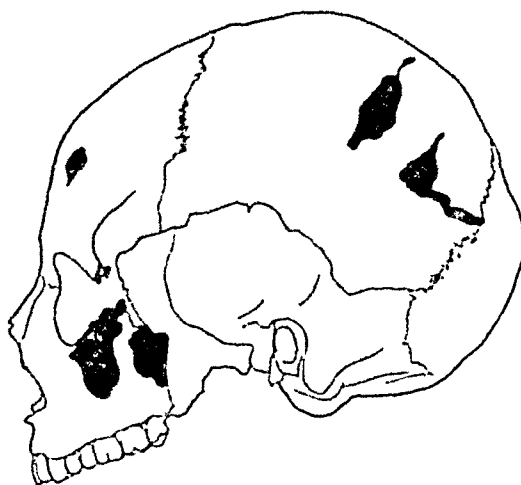


Fig. 84

The lower jaw is well preserved. The ascending ramus is moderately high (60 mm) and wide (35 mm), having shallow wide sigmoid notch and low blunt coronoid process. Chin is bilateral and protruding. The gonial angles are turned slightly inwards, the bigonial diameter being 84 mm. The depth at the mandibular symphysis is 27 mm. Mandibular teeth are represented by 15 intact teeth and the left central incisor is missing. Both left and right M_1 show signs of caries.

ANALYSIS

Three adult skulls comprising one male and two females from Mound Area have been taken into account for the purpose of present study. It is noteworthy that the adult male found at Mound AB stands apart from the other skulls of Harappa being exceptional in non metric and morphometric features. In norma frontalis the adult male skull Skl. 11635 shows pronounced and almost continuous



Frontal view



Vertical view



Left lateral view



Occipital view

browridges, receding forehead, chamaerrhine nose sunken at the root with no subnasal prognathism. The other cardinal features are (i) high vault of the skull rising to an apex at the crown, (ii) reduced post-orbital length and (iii) flattened occiput (*abgehackt*), which undoubtedly conform its affinity with Armenoid strain, hitherto unknown at Harappa.

Of the two adult female skulls represented in this area, one [Skl. Mound AB (Rec.)] is excellently preserved and complete, and the other (Skl. 5440 D) is incomplete. The complete one is long-headed, gracile and smooth-contoured having medium vault, smooth forehead, narrow prominent nose, protruding occiput and ill-developed muscular attachments. Although this female possesses a slightly lower value of cranial index (69.83), judging the essential cranio-facial features it could be well assigned to a type which have been designated as Type A₁. The other female skull (Skl. 5440 D) could not be definitely diagnosed due to its incompleteness; but it is enough to say that this one is also a gracile and smooth-contoured long-headed skull similar to Type A₁.

CEMETERY H STRATUM II (OPEN BURIALS)

Area (Cemetery) H lay south of Mounds AB and J, comprised two distinct strata, namely stratum I and stratum II, which yielded human skeletons. The human remains found at Cemetery H st II (open burials) are fragile and have suffered a considerable damage; but the amount of disintegration that has taken place in the contents of the burial jars Cemetery H st I (jar burials) is mostly due to the pressure of the superincumbent earth and percolation of rain water into the jars.

The human skeletal remains found in Cemetery H st II (open burials) represent 26 individuals, 11 of whom are adult males, 8 adult females, a female youth aged about 14 years, two children aged between 6 to 12 years and four adults whose sex could not be determined. Of the total number of 19 adult skulls found, 13 adults were considered for the present study. The rest are either crushed or so distorted that no reliable observation about their shape and dimension can be done. In appearance, the bones are of pale fawn colour, not unlike those found at Nal and Mohenjo-daro. The sex and age distribution of the adult skulls studied are tabulated below. It appears from the following table that the percentages of aged individuals are strikingly low among the people from Cemetery H st II (open burials).

TABLE 74

SEXWISE AGE DISTRIBUTION

SEX	LESS THAN 25 YEARS	25-30 YEARS	30-40 YEARS	40-50 YEARS
MALE		H 184 (K)	—	H 307 (a)
		H 484 (a)		
		H 487 (a)		
		H 502 (G)		
		H 695		H 698
FEMALE	H 306 (a)	H 88	—	H 710
	H 699	H 488		
		H 501 (a)		

A. CRANIA

SKL. H 307 (a) [Fig. 85]

The sex is undoubtedly male, aged about 40-50 years. Damaged in the left temporal and facial parts. The skull is rather large and thick-walled. Coronal and sagittal sutures are partly obliterated and the lambdoid is open. Both mastoids are large and muscle attachments well developed. Glabella is prominent and supraorbital ridges moderately developed. The forehead is broad (99.5 mm) : left orbit is of medium-height, rectangular, slightly oblique and right orbit falls into a low mesoconchal division of index (75.56). Norma verticalis is *pentagonoid* with prominent parietal bosses. When viewed from the side the skull appears to be well arched with a gradual and uniform curve. The skull is mesocranic (L-B Index 75.13), orthocranic (L-H Index 70.37) and metriocranic (B-H Index 93.66). In norma occipitalis the cranial contour represents the so called 'house' shape. The estimated cranial capacity is 1474.07 cc.

SKL. H 487 (a)

Adult male, aged about 25-30 years. The right and left parietal surfaces are partially absent, leaving only the central portion of the cranial vault. The greater part of the forehead and the right half of the face including the nose and the palate are intact but the outer rim of the left orbit and part of the left maxilla are missing. The supraorbital ridges are not prominent and muscular attachments are moderately developed. As viewed in norma lateralis the skull appears very long (cranial length 191.0 mm). The forehead is slightly inclined and goes back in an even curve, and the occiput is fairly prominent. The left orbit is squarish and mesoconchal in form (left OI 79.49), inclined downwards and laterally. The nasal aperture is narrow and leptorrhine (NI 45.45). The palate is broad and *parabolic* in shape. All the teeth have erupted and the molars moderately abraded (dentine exposed on cusps).

SKL. H 502 (G)

The skull is incomplete and appears to be that of an adult male. The entire skull vault is missing and right side of the face is considerably distorted. The cranial contour is *ovoides* in shape and the occiput fairly rounded. The glabella is prominent, with narrow concave nose and relatively broad mid-facial region. The face is of moderate length: from nasion to gnathion it measures 116 mm, the nasion-prosthion length is 66 mm.

The lower jaw is almost complete (with all the teeth intact), except for the coronoid and condyloid processes of the right ascending ramus. The teeth are moderately worn down. The lower molars on both sides have four cusps each.

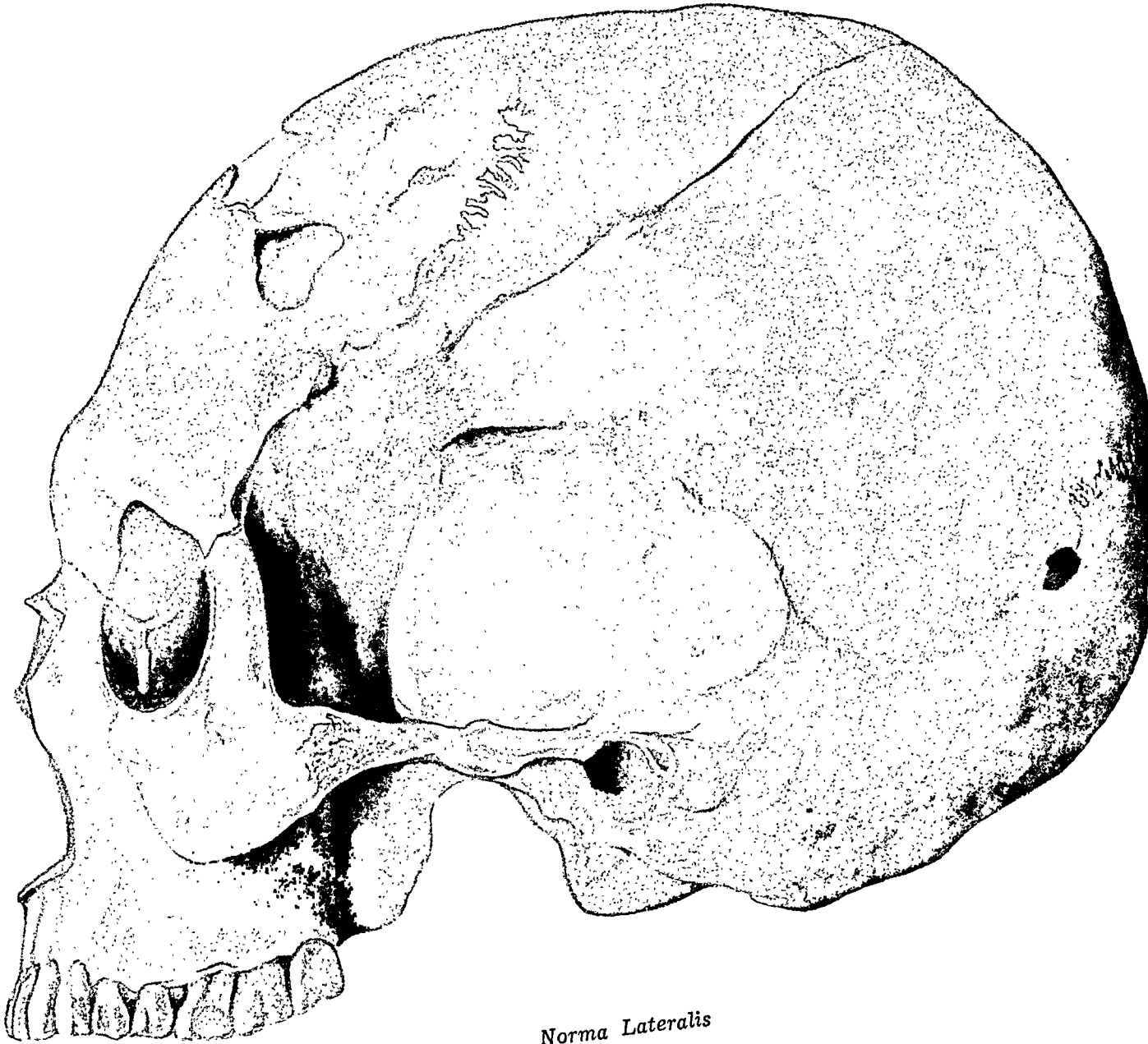
SKL. H 695 [Pl. LXIII]

Adult male, aged about 30 years. Damaged on the left parietal side, right temporal region and part of the face. The colour of the skull is greyish brown, the head is large with thick-walled cranial bones. The right mastoid is broken, the left quite large. Supraorbital ridges are medially strong but



Norma Frontalis

DIOPTOGRAPH TRACING (WASH) : MALE SKL. H 698 (Natural Size)



Norma Lateralis

DIOPTOGRAPH TRACING (WASH) : MALE SKL. H 698 (Natural Size)

laterally absent. It is a high skull, the basi-bregmatic height being 137 mm. The forehead is of medium height and slightly receding. The vertex is slightly arched and passes into a non-protuberent occiput. Orbits are squarish and the nose is rather wide, nasal index being 51.38 ? (chamaerrhine). Norma verticalis is *pentagonoid* in shape, narrowed in front and expanded at the parietals. The skull is sub-brachycranic (L-B Index 79.27 ?) and orthocranic (L-H Index 70.98). The palate is broad, deep and *upsiloid* in shape. The calculated capacity of the cranium gives aristencephalic value (1600.70 cc ?).

SKL. H 698 [Fig. 87; Pls. LIII, LIV, LXIV : 1-2]

The skull is complete with mandible. There is a long horizontal depressed fracture in the right parietal (plate LXXVIII fig. 2), probably produced by some metallic edged weapon. The sex is undoubtedly male; the prominent glabello-superciliary region, big right mastoid process and well-developed muscular attachments are masculine features. None of the cranial sutures is closed, but the basilar suture is united. In norma verticalis, the theca cranii is *ovoides* in shape. In norma temporalis the forehead is inclined and passes back into a convex vertex which slopes evenly down to a rounded occiput. The skull is mesocranic (L-B Index 75.75), hypsicranic (L-AH Index 64.85) and lies in the border between metriocranic and acrocranic (B-AH Index 85.61). Norma facialis shows fairly medium face (the total facial index being mesoprosopic 85.66) with quadratic orbits. The nose is leptorrhine with an index of 47.62. All the maxillary teeth have erupted and cusps are moderately abraded.

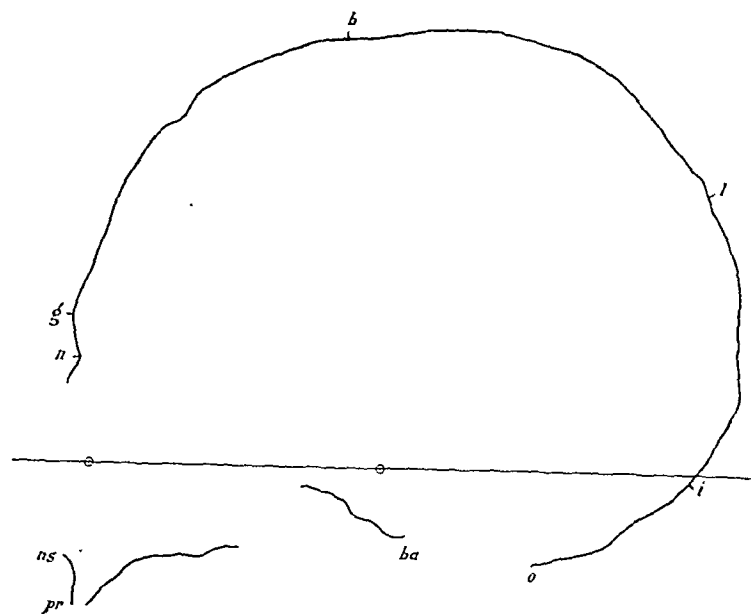


Fig. 87 Skl. H 698

Mandible is well preserved with all the teeth in their sockets. The corpus is moderately large and ramus broad. The mylohyoid ridge of the mandible is pronounced, as are the pterygoid attachments. Chin is bilateral and projecting.

SKL. H 88

Adult female, aged about 30 years. The skull is incomplete. Whole of the basis cranii, greater part of the nuchal plane of the occiput, lateral margin of the right orbit, *os sphenoidale* and left *os temporale* are missing. In *norma verticalis* the skull is somewhat ellipsoidal, the parietal eminences not being very prominent. The maximum length of the cranium is 194 mm. In *norma temporalis* the forehead rises with a somewhat backward inclination and passes into relatively low arched vertex which slopes down obliquely into a fairly prominent *tuber occipitale*. The glabello-superciliary region is not prominent and nasion is not sunken at the root. The nasal bone is short but prominent with the ridge faintly concave in outline. In *norma facialis* the face is of medium height, nose fairly narrow and left orbit hypsiconchal in form (OI 94.67). Palate is moderately deep and *parabolic* in shape. All the maxillary and mandibular teeth have erupted and appear to be free of caries.

The mandible is small and gracile in its general appearance. The muscular markings in the diagastric, massestercic and pterygoidal insertional areas are only mildly developed. Chin is prominent and the mandibular angle is straight and not everted. The lower dental arcade is *upsiloid* in shape and teeth show considerable signs of attrition.

SKL. H 488 [Figs. 86, 88]

Probably adult female, about 30 years. The skull is incomplete, greater portion of the left temporal bone and small part of the left occipital bone are missing. Mastoids are medium in size. Supraorbital ridges are laterally absent but present moderately medially. The face is rather low and medium in breadth. Orbits are low, rectangular and chamaeconchal in form (right OI 73.81 and

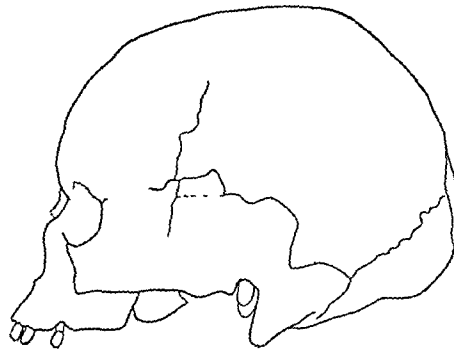


Fig. 88

left OI 75.00). The nasal aperture is fairly wide and short, and the index falls within chamerrhine class. *Norma verticalis* is long ovoid with slight parietal eminences. In *norma temporalis* the nasion is not deep, the frontal bone is slightly inclined and passes smoothly into the slightly domed vertex with a pre-lambdoid flattening. Occiput is house shaped. It is of interest to note the presence of *os inca*.

SKL. H 699 [Fig. 89]

The skull is of an adult female in the prime of life. The glabella is not prominent, mastoids are small and superior margin of the orbits are sharp. The lower jaw was found articulated in the skull. The upper part of the forehead extending up to the bregma was chopped off presumably

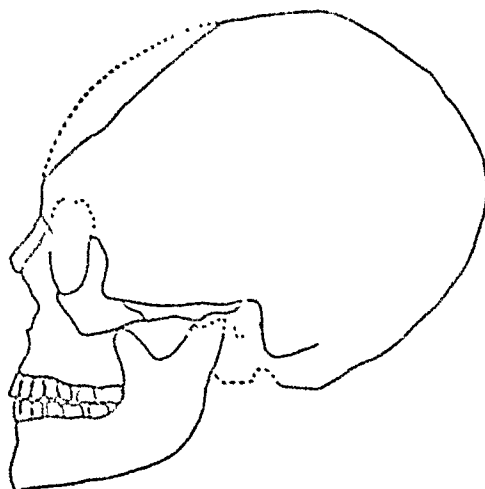


Fig. 89

accidentally during excavation. From the top, the skull is ovoid without parietal eminences. The cranium is brachycranic (L-B Index 80.24). The nasal ridge is short, slightly concave and nasion is not depressed at the root. The nasal aperture is short and of medium breadth with an index of 52.87 (chamaerrhine). There is also evidence of slight mental protuberance.

The mandibular body length is 70.0 and bigonial diameter is 79.0 mm.

SKL H 710

Adult female, about 45 years of age. The skull is incomplete, lacks the entire facial region and a large portion of the vertex. Size is rather small, supraorbital ridges are ill developed and the

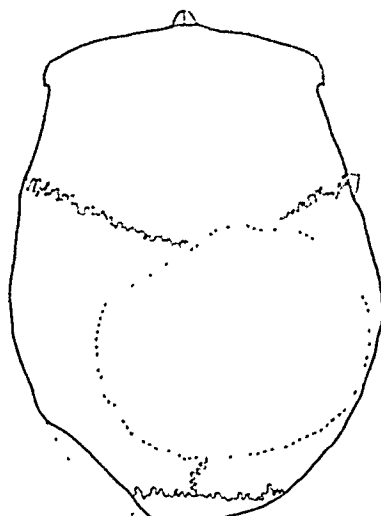


Fig. 90

mastoids small. Viewed from the top, the skull is an elongated oval. From the side, the forehead is vertical with a gradual bend at the metopion. The occipital line is marked by a prominent occipital protuberance. The mandibular fossae are of medium depth.

ANALYSIS

There are 13 adult skulls belonging to Cemetery H st II (open burials). On the basis of morphometric data and cranioscopic observation (Collective Tables D, I & J) 5 of these have been typed as round-headed B₂ type (four males, one female), 3 have been typed as long-headed gracile A₁ type (one male, two females) while one long-headed female skull with medium supraorbital ridges, moderately deep subglabellar notch, low face and wide nasal aperture is attributed to Type A. The remaining four skulls [H 184 (K), H 306 (a), H 484 (a) & H 501 (a)] cannot be considered for type diagnosis. The sexwise distribution of the typical adult skulls are given below :

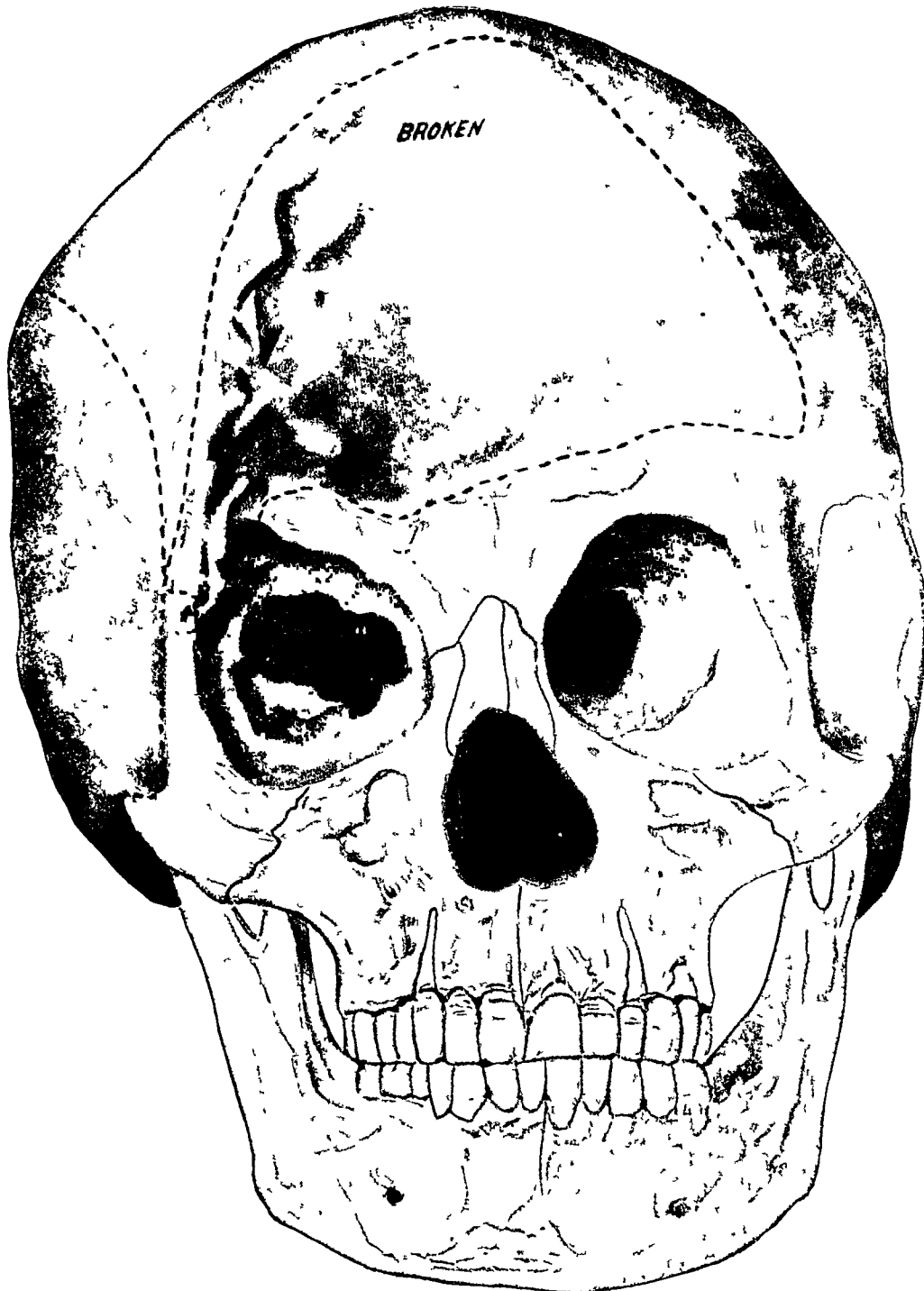
SEX	TYPE A	TYPE A ₁	TYPE B ₂
MALE	—	H 487 (a)	H 695 H 502 (G) H 307 (a) H 698
FEMALE	H 488	H 710 H 88	H 699

The round-headed Type B₂ skulls are not identical with the round-headed skulls from Area G, called as Type B₁. Three skulls, however, classified here as Type A₁ are comparable to Type A₁ skulls from Cemetery R 37 and Area G.

TYPE B₂

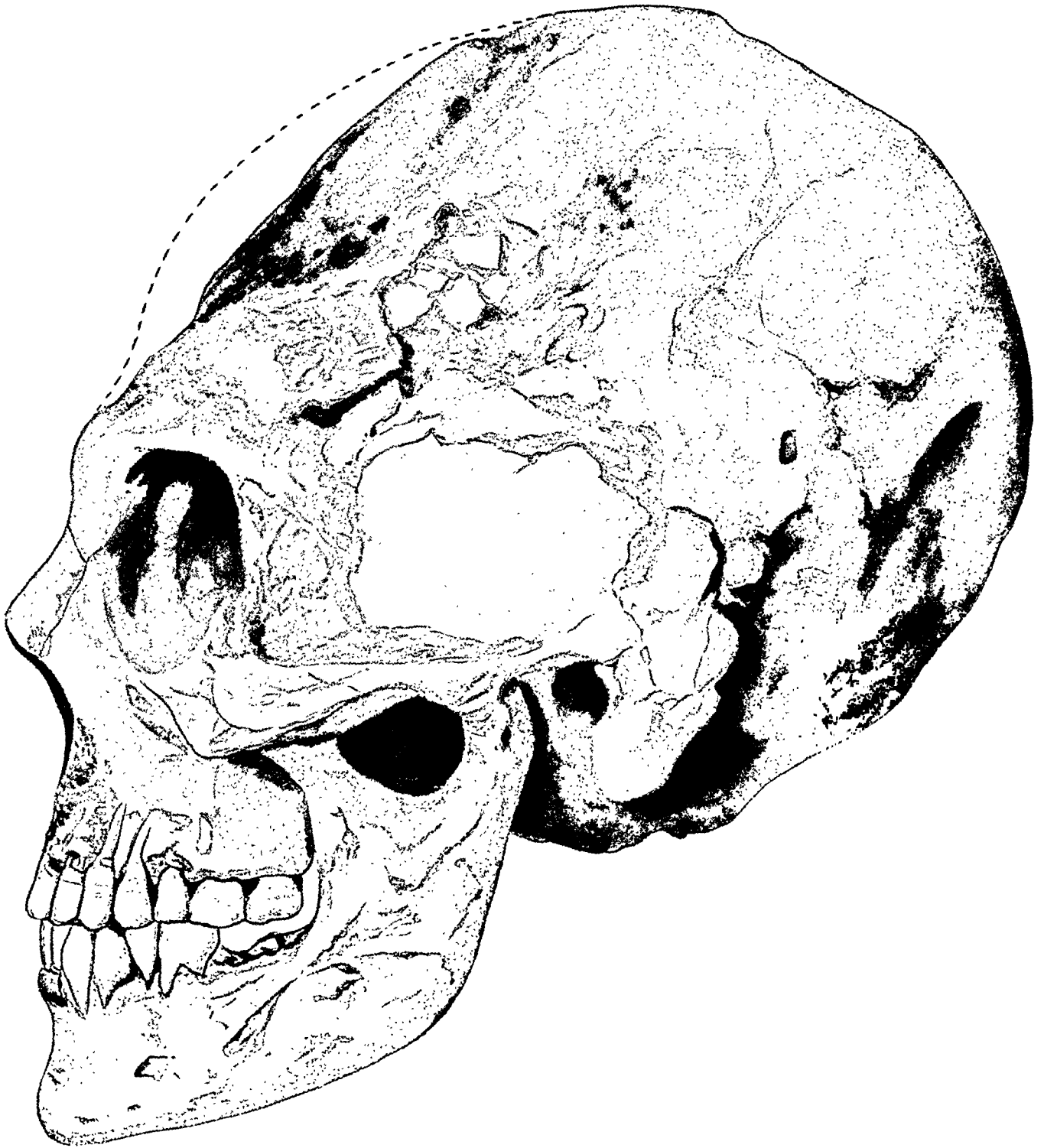
In tables 85 to 90 are presented in detail the mean neurocranial and splanchnocranial measurements and indices for four males, and in tables 107 to 110 the neurocranial and splanchnocranial measurements and indices of a single female, classified as belonging to the round-headed Type B₂. The cardinal cranio-facial proportions of the Type B₂ male and female from Cemetery H st II (open burials) are as follows :

	MALE		FEMALE	
Length-breadth index	Mesocranic	(76.72 ± 1.18)	Brachycranic	(80.24)
Length-height index	Orthocranic	(71.82 ± 1.16)	Hypsocranic	(80.84)
Breadth-height index	Metriocranic	(93.68 ± 2.40)	Acrocranic	(100.75)
Length-auricular height index	Hypsocranic	(64.85)	Hypsocranic	(65.27)
Total facial index	Mesoprosopic	(85.66)	Leptoprosopic	(92.17)
Superior facial index	Mesen	(50.00)	Mesen	(50.43)
Orbital index	Mesoconchic	(83.74 ± 3.01)	Hypsiconchic	(91.57)
Nasal index	Mesorrhine	(49.50)	Chamaerhine	(52.87)
Palatal index	Leptostaphyllin	(77.12)	—	—
Trans. fronto-parietal index	Metriometopic	(67.13 ± 3.35)	Metriometopic	(67.16)



Norma Frontalis

DIOPTOGRAPH TRACING (WASH) : MALE SKL. H 699 (Natural Size)



Norma Lateralis

DIOPTOGRAPH TRACING (WASH) : MALE SKL. H 699 (Natural Size)

Disparity in cranio-facial proportions in the male and the female B₂ type is distinct. But discussion on this point, on the basis of a single female cranium, appears not justifiable. The round-headed male B₂ type skulls have obtained their cranial form mainly by increased breadth rather than decreased length. The average cranial length, however, is nearly same as that of the basic long-headed type of Cemetery R 37.

In Plate LVII and in Figures 91-93, photographs and dioptographic drawings of a round-headed Type B₂ male skull are presented. In the front view the face is broad and of medium height, the nasal aperture is of average height and width to give a mesorrhine index. In the lateral view the forehead is high and little inclined, the vertex appears to be well arched and the occiput is curved, rather than flattened. From the top, the cranial contour is *ovoides* in shape with marked parietal bosses.

TYPE A

The important cranio-facial characters of the single female Type A skull from Cemetery H st II (open burials) is as follows :

Length-breadth index	Dolichocranic	(71.93)
Length-height index	Orthocranic	(73.02)
Breadth-height index	Acrocranic	(101.52)
Length-auricular height index	Orthocranic	(59.95)
Breadth-auricular height index	Metriocranic	(83.33)
Orbital index	Chamaeconchic	(74.40)
Nasal index	Hyperchamaerrhine	(66.67)
Palatal index	Leptostaphyline	(78.41)
Trans. fronto-parietal index	Eurymetopic	(71.21)

The cranio-facial proportions of the Type A female skull of the open burials are closely similar to the female Type A crania from Cemetery R 37. The discrepancy with regard to nasal and orbital index is apparently fortuitous or may be individual variation.

In Plate LVIII and Figures 94-96 are presented photographs and dioptographic drawings of Type A female skull from stratum II (open burials). The face is rather low, medium in breadth and supraorbital ridges are present moderately medially. The vertical contour is seen to be long ovoid.

TYPE A₁

In tables 102 to 106 the average cranial and facial measurements and indices of open burials Type A₁ are presented in detail for two females and in tables 81 to 84 for one male. In view of the fact all the three skulls representing Type A₁ are broken, typology was done primarily on the basis of morphological observations. The skulls are on the whole gracile; the supraorbital ridges are not prominent and muscular impressions weak. In lateral view the skulls are very long, the forehead slightly inclined and the occiput fairly prominent with a *chignon*.

DISCUSSION

Cemetery H st II (open burials) is represented by three cranial types, namely, Type A, Type A₁ and Type B₂. Type A and Type A₁ are both long-headed and they appear to be similar to the people representing Cemetery R 37. There is no hesitation in identifying the solitary female skull No. H 488 with the dolichocephalic Type A crania, already noted in Cemetery R 37. There is also appreciable resemblance of Type A₁ crania of Cemetery H open burials with those of Cemetery R 37 and Area G, both in morphometric and in non-metric characters. On the other hand, round-headed B₂ type from open burial differs from the round-headed B₁ type of Area G in being larger in size and having more retreating frontal bones. The cranial capacity of the Type B₂ skulls is fairly large and the absolute value for the capacity differs markedly from the earlier B₁ type skulls. B₂ type is characterized by large cranial capacity (1505.19 cc.) and mesocephalic head. The face is medium in breadth with an upper face index of 50 (males). The vertex is well arched with curvo-occiput and the skull is hypsicephalic. However, in cranio-facial dimensions the Type B₁ skulls from Area G are distinctly shorter when compared with Type B₂ skulls. The most marked difference is found between the calvarial lengths. The average cranial length of the Type B₂ male is 188.62 mm, while the mean cranial length for Type B₁ male is 177.00 mm. In Type B₁ the cranial vault seems to be shorter and lower than in the Type B₂; appreciable difference between the two types is also noticed in the facial region of the skull.

In the following table the average value for some important cranial and facial dimensions as well as indices of Type B₁ and Type B₂ have been compared with the round-headed Alpine male from Hissar III.

	Maximum Length	Maximum breadth	Basion Bregma height	Upper face height	Bizygomatic breadth	Cephalic Index	Length-height Index
Round-headed Alpine Hissar III	177.4	136.2	134.4	66.8	129.6	76.77	75.77
Round-headed Type B ₁ Area G	177.0	140.8	132.6	64.7	129.5	79.54	75.01
Round-headed Type B ₂ Cemetery H (open burials)	188.6	144.7	135.3	69.7	136.0	76.72	71.82

It is at this point again worth mentioning that the Type B₁ skulls from Area G are closely similar in major calvarial diameters, in facial height and width to the round-headed type of Hissar III designated by Krogman (1940 : 22) as Alpine.

In cranial and facial dimensions Type B₂ skulls are distinctly larger than the Type B₁ and round-headed Alpine type of Hissar III, but these differences in absolute measurements are not reflected in the salient cranio-facial proportions, of which such characters are components. This round-headed B₂ type may be an Alpine variant or a mixed variety of the Alpine. This type is predominant at Cemetery H st II.

B. EXTREMITY BONES

Great handicap was felt for a definitive morphological study of the extremity bones due to incompleteness. Measurements which have, however, been taken on them, are assembled in Collective Tables M-N.

HUMERUS

Fourteen adult male humeri (seven of each side) and twelve adult (five right and seven left) ♀ have been measured.

TABLE 75

Humerus

Characters	M				F			
	n	Mean	Range		n	Mean	Range	
Maximum length	7	326.86	320.0 - 341.0		7	285.71	267.0 - 298.0	
Breadth of proximal epiphysis	6	51.17	50.0 - 52.0		6	43.75	40.0 - 46.5	
Breadth of distal epiphysis	6	62.83	59.5 - 64.5		6	56.25	54.5 - 58.0	
Circumference of the shaft at the middle	8	65.88	62.0 - 69.0		9	61.06	55.0 - 65.0	
Minimum circumference of diaphysis	9	59.33	55.0 - 65.5		10	53.95	49.0 - 56.0	
Robusticity index	7	17.95	16.72- 19.00		7	19.14	18.46- 20.22.	

The humeri of Skl. H 502 (G) rt & lt, H 695 (rt) and H 698 (lt), all of which belong to adult male, are well developed and sturdy built. Mean values pertaining to some of the important measurements and indices of humeri are produced in Table 75. The maximum length of humerus lies within a total range of 267 mm to 341 mm, irrespective of sex, which is nearer to the lower limit of the world range of 260-380 mm (Martin 1928 : 1100). Males exceed the females in mean length measurement ; the average for males is 326.86 mm and for females 285.71 mm.

Contrary to general tendency of different human groups (Martin 1928 : 1134) in robusticity index the male average (17.95) falls short of the female average (19.14), the index for the males ranging between 16.72-19.00 and for the females between 18.46-20.22.

The perforation of fossae olecrani was noticed in five cases, viz., Skl. H 488 (lt), H 502(G) (rt), H 694 (lt), H 696 (rt) and H 699 (lt). Mean length of male humeri of Cemetery H St II (open burials) falls much short of Cemetery R 37. In circumference also the present series gives a lower value than that of Cemetery R 37.

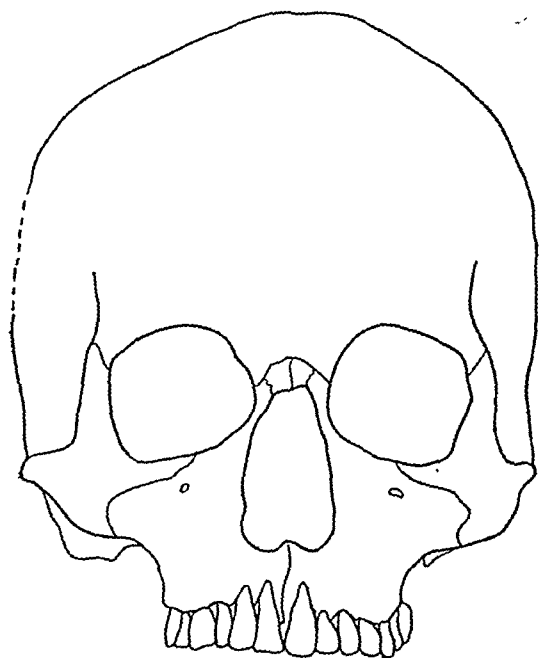


Fig. 91 *Norma Frontalis*

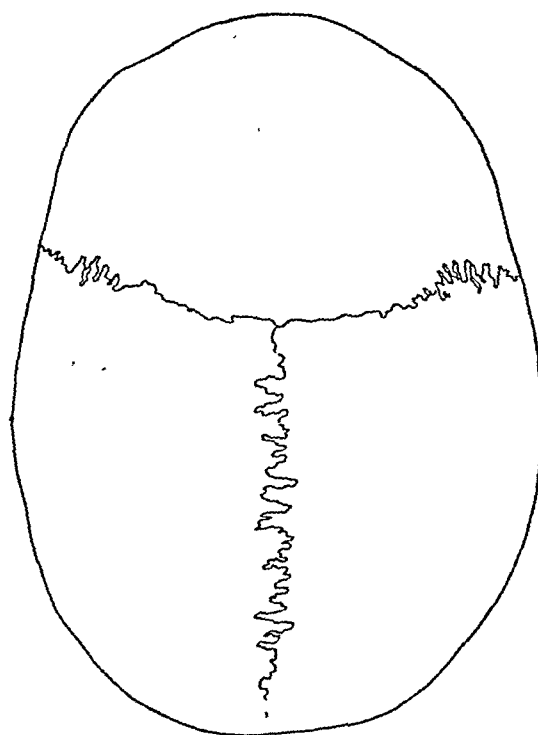


Fig. 92 *Norma Verticalis*

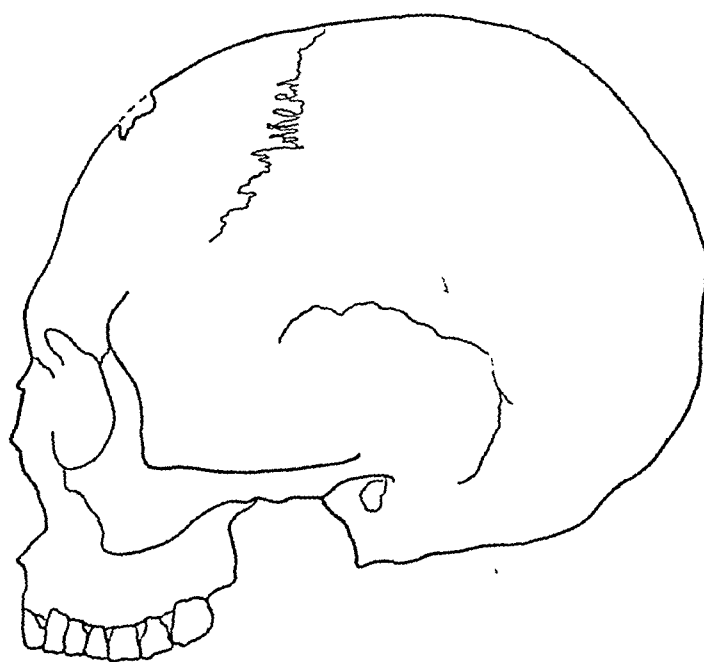
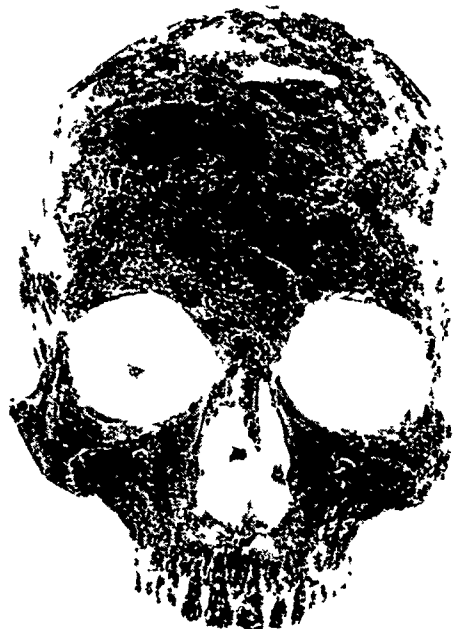


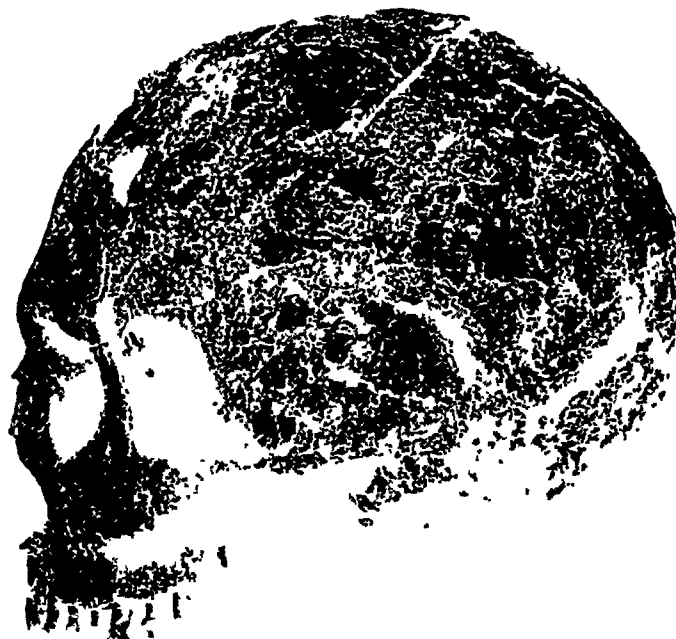
Fig. 93 *Norma Lateralis*



Norma Frontalis



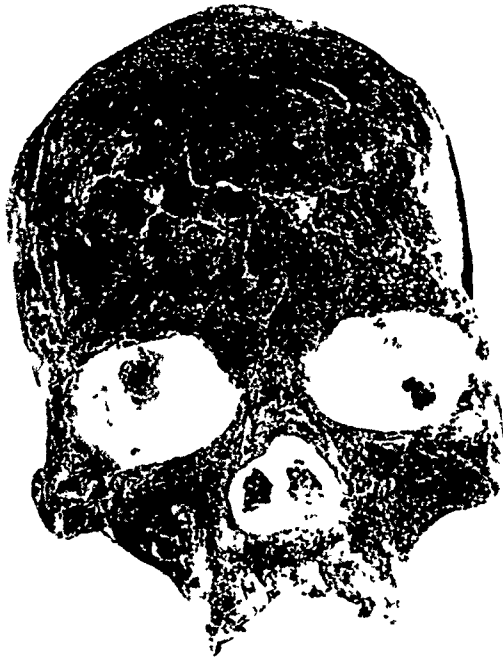
Norma Verticalis



Norma Lateralis

Photographs of Type B₂ Male [Sk1. H 698] of Cemetery H St. II (Open burials)

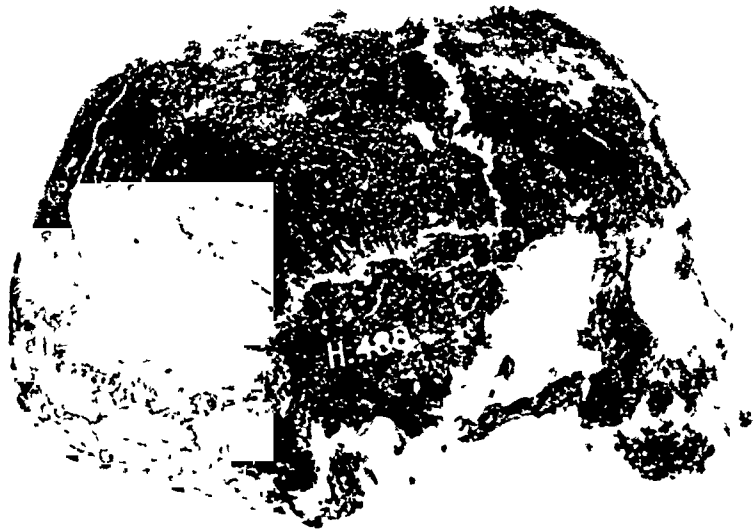
LVIII



Norma Frontalis

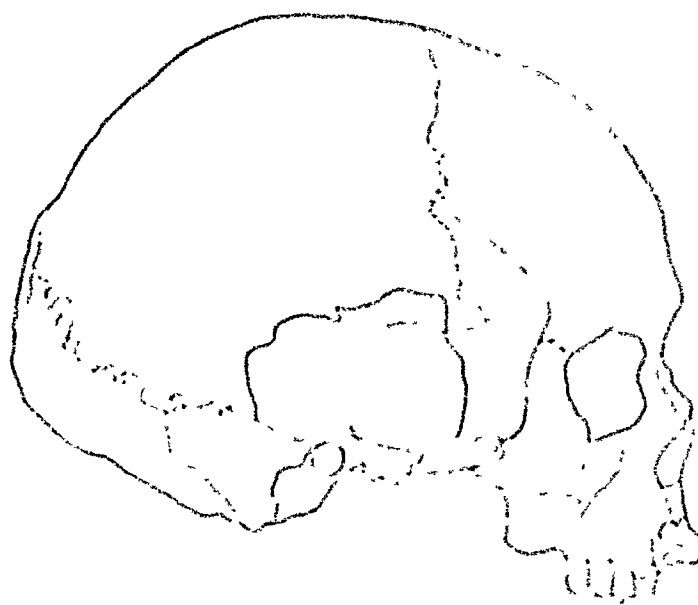


Norma Verticalis



Norma Lateralis

Photographs of Type A Female [Sk. H 488] of Cemetery H St. II (Open burials)

Fig. 94 *Norma Frontalis*Fig. 95 *Norma Superior*Fig. 96 *Norma Lateralis*

Figs. 94, 95 & 96. Diophtographic contours of Type A Female (Sk. II 488) of Cemetery II St. II (Open burials)

RADIUS

Only bones of three males (two right and one left) and two females (one right and two left) could be measured, the rest being unsuitable for metrical use. Some of the important mean values are shown in Table 76.

TABLE 76

Radius

Character												
		M	A	L	E		F	E	M	A	L	E
	n	Mean	Range				n	Mean	Range			
Maximum length	2	253.50	251.0 - 256.0				3	225.00	221.0 - 233.0			
Physiological length	3	243.17	232.0 - 257.0				3	210.83	206.0 - 218.0			
Minimum circumference of diaphysis	3	41.33	41.0 - 42.0				3	36.67	35.0 - 38.0			
Robusticity index	3	17.03	15.95- 17.67				3	17.42	16.06- 18.27			

The mean maximum length is 253.5 mm for males and 225 mm for females. In robusticity index females (17.42) appear to have slightly higher average than males (17.03). The difference between the maximum length and the physiological length is 10.33 mm for males and 14.17 mm for females.

ULNA

Five bones (two right and three left) three males and seven bones (three right and four left) of four females have been considered useful for measurement. In Table 77, their mean values are given.

TABLE 77

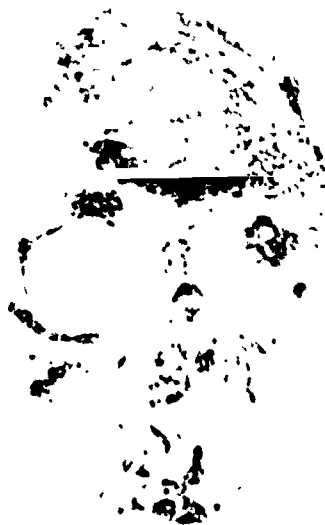
Ulna

Character												
		M	A	L	E		F	E	M	A	L	E
	n	Mean	Range				n	Mean	Range			
Maximum length	4	274.50	268.0 - 289.0				4	245.75	242.0 - 253.0			
Physiological length	5	248.80	241.0 - 262.0				7	226.29	217.0 - 238.0			
Minimum circumference of diaphysis	4	33.50	31.0 - 37.0				7	30.36	26.0 - 32.5			
Robusticity index	4	13.47	12.86- 14.92?				7	13.45	10.92- 14.68			

The averages of maximum length is 274.5 mm for males and 245.75 mm for females. In robustness both the sexes are relatively equal as revealed from their robusticity index.

FEMUR

Four femora (two right and two left) of two male individuals and five (two right and three left) of three females have been considered. Their important mean metrical values are scheduled in Table 78.



Norma Frontalis



Norma Lateralis



Norma Frontalis



Norma Verticalis



Norma Lateralis

Photographs of Type A₁ Female [Sk1. H 88] of Cemetery H St. II (Open burials)

TABLE 78

Character	Femur									
	M	A	L	E	F	E	M	A	L	E
	n	Mean	Range		n	Mean	Range			
Maximum length	—	—	—	—	3	389.00	378.0 - 410.0			
Length in natural position	—	—	—	—	3	388.33	378.0 - 408.5			
Sagittal diameter at middle of diaphysis	4	24.12	22.0 - 27.0		5	22.10	20.0 - 24.0			
Transversal diameter at middle of diaphysis	4	27.25	26.0 - 28.5		5	25.50	23.0 - 27.5			
Circumference of the shaft at the middle	4	87.75	83.0 - 95.0		5	80.40	80.0 - 81.0			
Length-thickness index	—	—	—	—	3	20.71	19.83- 21.16			
Robusticity index	—	—	—	—	3	13.28	12.61- 13.76			
Pilastric index	4	99.46	83.64- 109.26		5	101.73	87.27- 117.39			
Platymeric index	4	77.05	71.43- 90.00		5	78.39	71.43- 85.71			

Due to absence of intact male femora, maximum length and length in natural position could not be taken.

In females however the difference between these two characters is not significant. Robusticity index which expresses the relation of the dimensions at the diaphysis middle and the length in the natural position is available for the females only, the mean being 13.28. Pilastric index is slightly higher in the females. Converse result is shown in platymeric index.

The femora of both the male skeletons H 502 (G) and H 698 are robust and strong built as revealed in their relief. Among the females the femur of Skl. H 710 appears to be slender and gracile than others.

It appears that females of the present series were relatively strong built than those of Cemetery R 37.

One conspicuous fact emerges from the table that in most of the indices females show higher value than males thereby indicating that females were comparatively robuster and stronger.

TIBIA

Only six tibiae (three right and three left) of five male individuals and five (four right and one left) have been utilised for consideration. Their important mean values are produced in Table

TABLE 79

Character	Tibia									
	M	A	L	E	F	E	M	A	L	E
	n	Mean	Range		n	Mean	Range			
Maximum length (spino-malleolar)	1	410.00	—	—	3	335.67	323.0 - 352.0?			
Physiological length	3	365.83	344.0 - 381.5		5	324.67	303.0 - 332.0			
Sagittal diameter at the middle	6	34.92	31.0 - 39.5		5	28.80	26.5 - 37.0			
Transversal diameter at the middle	6	22.83	20.0 - 25.0		5	18.90	17.0 - 20.5			
Minimum circumference of diaphysis	5	80.00	70.0 - 85.0		5	68.00	63.0 - 70.0			
Index of cross-section in the middle	6	65.66	58.23- 71.43		5	65.58	63.22- 68.23			
Robusticity index	1	21.12	—	—	3	20.33	12.54- 21.07			

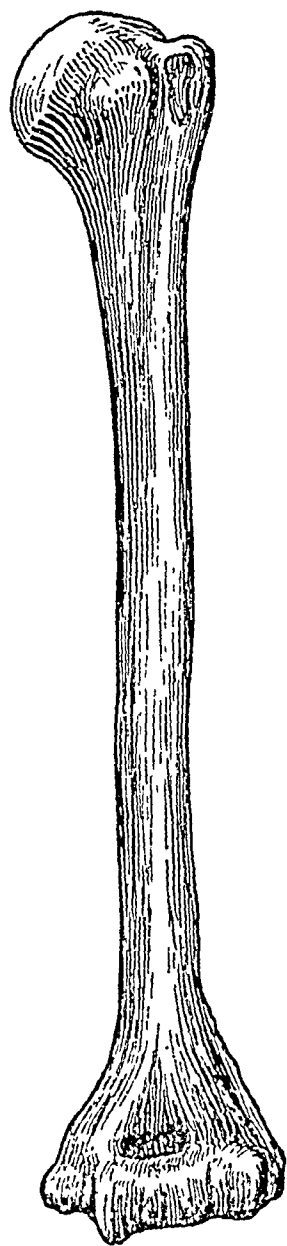


Fig. 1 Skl. H 694
Male (Lt)

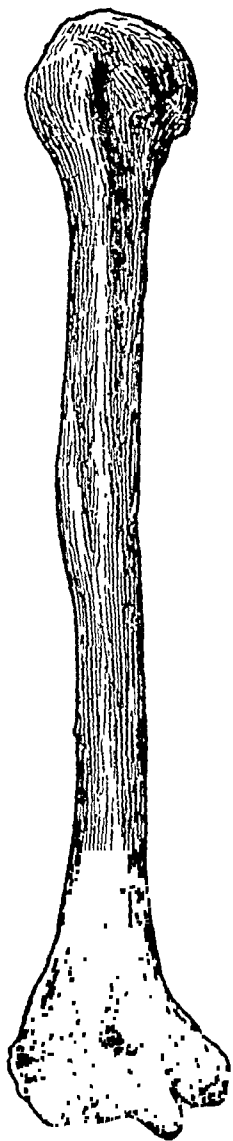


Fig. 2 Skl. H.P. 306(a)
Female (Rt)

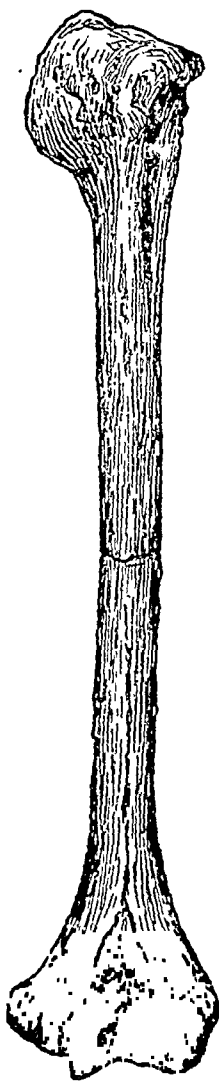


Fig. 3 Skl. H 699
Female (Lt)

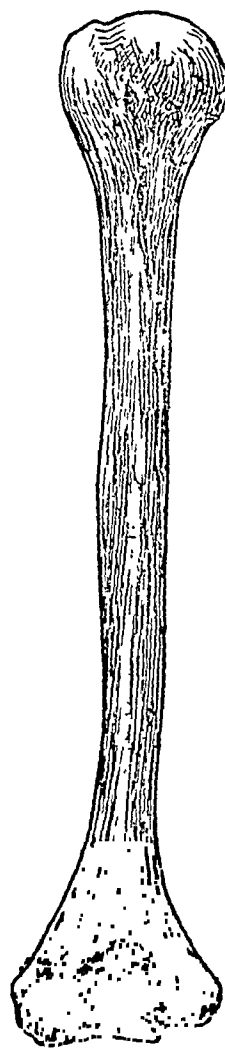


Fig. 4 H 710
Female (Rt): Type A₁

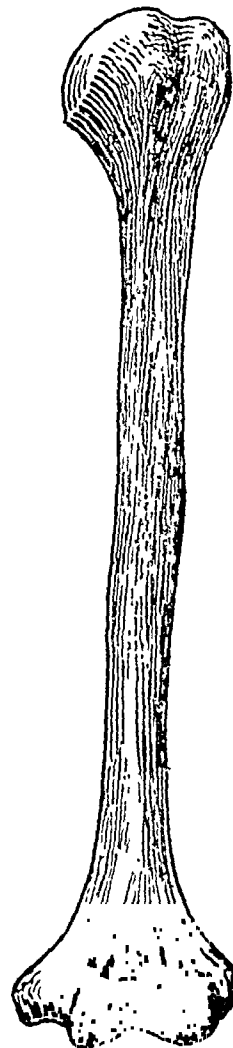
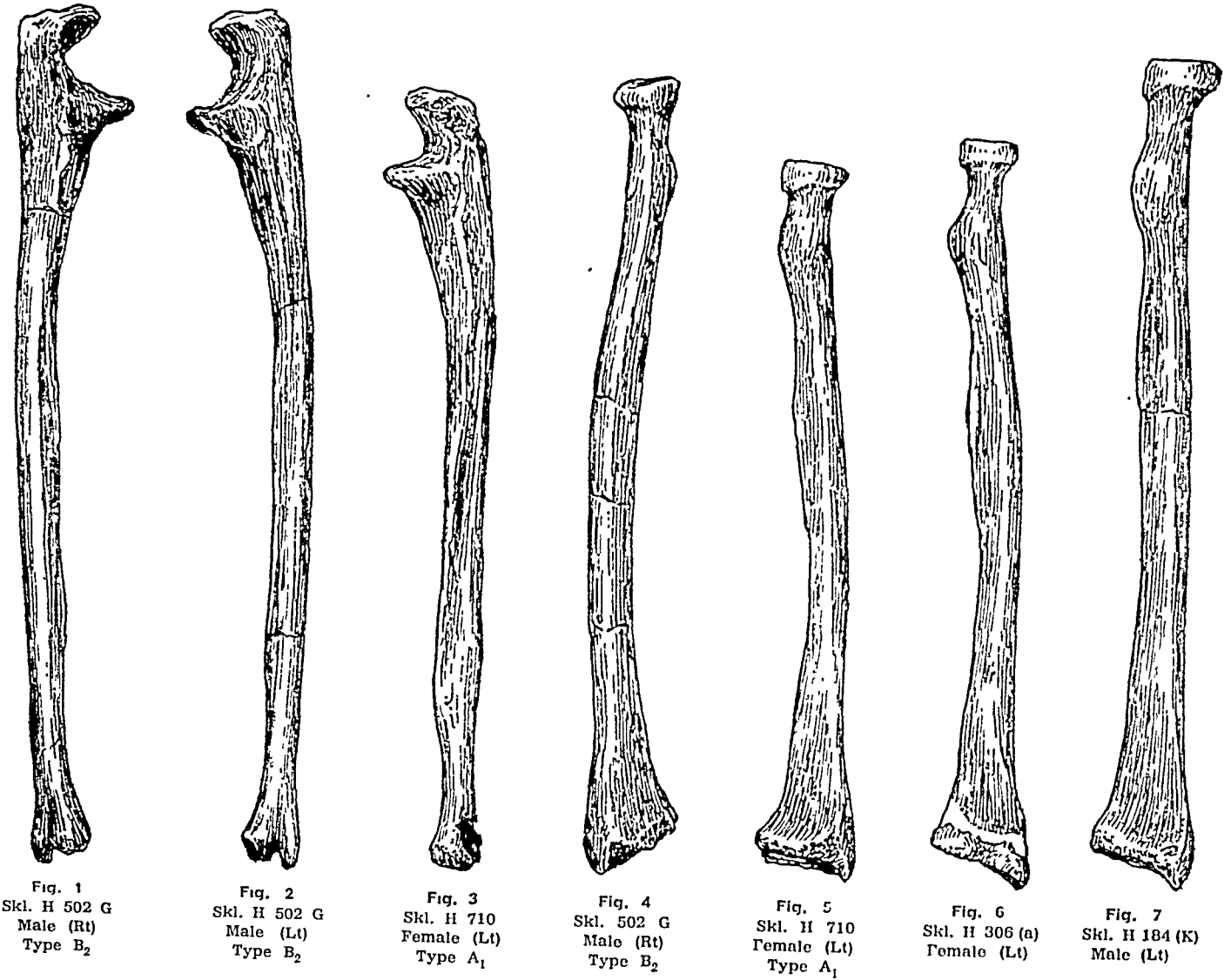


Fig. 5 H 710
Female (Lt): Type A₁

Figs. 1-5. Anterior or Flexor aspect of the Humerus : Cemetery H St. II ($\frac{1}{2}$ Natural size)



Figs. 1-3 Radial aspect of Ulna; Figs. 4-7 Volar aspect of Radius : Cemetery H St. II ($\frac{1}{2}$ Natural size)

In mean physiological length both the sexes of the present series are shorter than that of Cemetery R 37. Index of cross-section at the middle, however, of the present series indicates higher values, irrespective of sex than that of Cemetery R 37.

FIBULA

Two fibulae (left) of two male individuals and two (one right and one left) of one female are utilized ; some of the mean values have been presented in Table 80 below :

TABLE 80

Fibula

Character								
		M	A	L	E		F	E
	n	Mean			Range	n	Mean	Range
Maximum length	1	369.00			— —	1	323.00	— —
Minimum circumference of diaphysis	2	40.00			40.0 - 40.0	2	35.00	35.0 - 35.0
Robusticity index	1	10.84			— —	1	10.84	— —

STATURE AND PROPORTION

It is intelligible from Collective Table O and P that in most of the cases Dupertuis and Hadden's 'general formulae' yield highest value with regard to calculated stature, and Manouvrier's table shows intermediate results.

The average male stature is found to be 1717.57 mm for six males according to Dupertuis and Hadden, and 1702.37 mm for eight males according to Manouvrier's table. In the case of females it is 1563.92 mm for four individuals according to former and 1575.57 mm for five individuals according to latter.

The mean difference of stature between the males and females is 153.65 mm according to Dupertuis and Hadden's 'general formulae' and 146.66 by Manouvrier's table. These differences are, however, within normal range of sex difference.

HUMAN REMAINS FROM HARAPPA
GUPTA, DUTTA & BASU

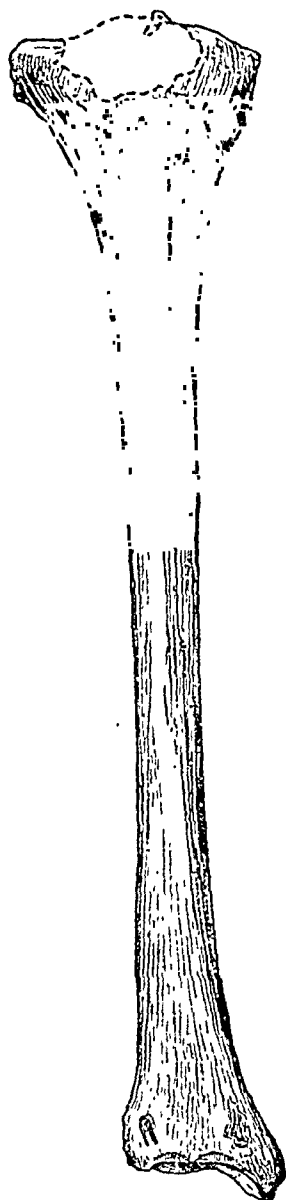


Fig. 1 Skl. H 710
Female (Rt) : Type A₁

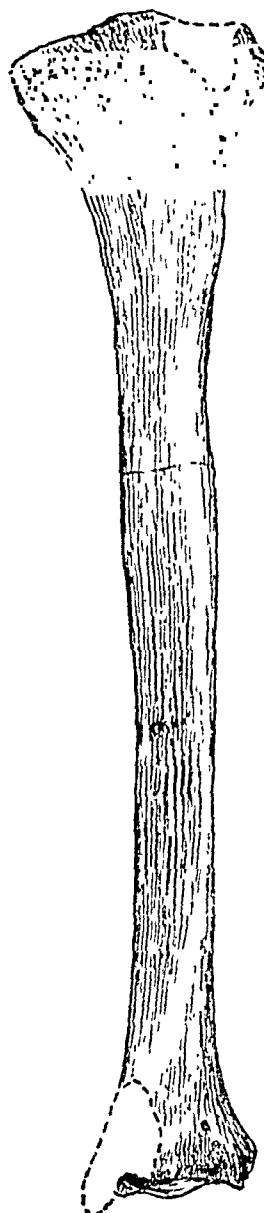


Fig. 2 Skl. H 710
Female (Lt) : Type A₁

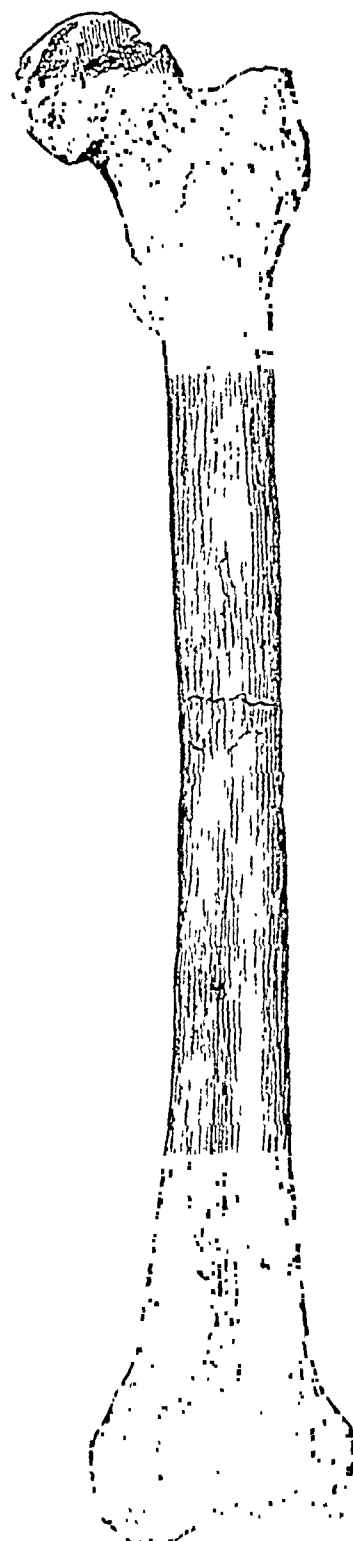


Fig. 3 Skl. H 710
Female (Lt) : Type A₁

Figs. 1-3 Anterior aspect of Tibia & Femur : Cemetery H St. II ($\frac{1}{2}$ Natural size).

It is not pertinent to predict stature of a population from insufficient data and it is all the more difficult to estimate stature of the sub-groups from even smaller data. However, the trend of the distribution of stature may be appreciated from the following table.

	STATURE ACCORDING TO		
	MANOUVRIER	PEARSON	DUPERTUIS AND HADDEN
Type A (F)	1523.03 (1)	1504.1 (1)	1538.4 (1)
Type A ₁ (F)	1602.74 (2)	1493.7 (1)	1533.6 (1)
Type B ₂ (M)	1706.77 (3)	1660.36 (2)	1710.95 (2)

It appears that three male individuals represented in Type B₂ [Skl. H 502 (G), H 695 and H 698] tended to be tall. One female (Skl. H 710) of Type A₁ was perhaps medium or below medium in stature. Similar is the case of a female (Skl. H 488) of Type A.

Extremity bones of two males [Skl. H 184 (K) and H 502 (G)] and of three females [Skl. H 306 (a), H 488 and H 710] have been used for finding out limb proportions of individual skeletons.

In brachial index (humero-radial) a female skeleton (H 488) had remarkably longer radius in proportion to humerus (82.77%).

Three individuals [males: Skl. H 184 (K), H 502 (G) and female : H 306 (a)] were mesatichic, giving 79.75, 77.47 and 79.79 ? respectively as index value. One female (Skl. H 488) was highly dolicho-chic (82.77%).

Crural index (tibio-femoral) which indicates the relation of the leg with respect to the thigh could be worked out in only one female individual (Skl. H 488), gives a value of 85.22.

The humero-femoral index by which the relative lengths of humerus and femur can be compared is 70.63 and 68.05 for Skl. H 488 and H 710 respectively, both being females. The tibio-radial index, which expresses the relation of radial to tibial length, is available for one female skeleton (Skl. H 488) only which is 68.42.

STATISTICAL CONSTANT : CEMETERY H ST II
(OPEN BURIALS)

TABLE 81

ADULT MALE TYPE A₁

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean
Max. cranial length	1	191.00
Nasion-inion length	1	184.00
Basion-bregma height	1	135.00
Min. frontal breadth	1	92.50
Median sagittal arc	1	383.00
Length-height index	1	70.68

TABLE 82

ADULT MALE TYPE A₁

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean
Prosthion-basion line	1	94.00
Nasion-prosthion line	1	70.50
Nasal height	1	55.00
Nasal breadth	1	25.00
Ant. inter-orbital breadth	1	18.50
Orbital breadth (right)	1	39.00
Orbital height (right)	1	31.00
Maxillo-alveolar length	1	57.00
Maxillo-alveolar breadth	1	63.00
Palatal length	1	43.50
Palatal breadth	1	39.50
Orbital index (right)	1	79.49

TABLE 82-Continued

Characters	n	Mean
Nasal index	1	45.45
Maxillo-alveolar index	1	110.53
Palatal index	1	90.80

TABLE 83

ADULT MALE TYPE A₁

Mean Indices of the Whole Skull

Characters	n	Mean
Vert. cranio-facial index	1	52.22
Long. cranio-facial index	1	49.21

TABLE 84

ADULT MALE TYPE A₁Mean Measurements and Indices of the
Maxillary Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₁	1	10.00
Labiolingual crown diam. of M ₁	1	12.00
Mesiodistal crown diam. of M ₂	1	8.75
Labiolingual crown diam. of M ₂	1	11.50
Mesiodistal crown diam. of M ₃	1	8.25
Labiolingual crown diam. of M ₃	1	10.75
Crown index of M ₁	1	120.30
Crown index of M ₂	1	128.60
Crown index of M ₃	1	131.11

TABLE 85
ADULT MALE TYPE B₂

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Max. cranial length	4	188.62	±	3.48	183.5	193.0
Max. cranial breadth	3	144.67	±	4.26	139.0	153.0?
Nasion-inion line	3	174.00	±	2.00	170.0	176.0
Basion-bregma height	3	135.33	±	1.20	133.0	137.0
Min. frontal breadth	3	96.83	±	2.19	92.5	99.5
Vertical porion height	1	119.00			—	—
Median sagittal arc	2	381.50			—	—
Vertical transversal arc	1	318.00			—	—
Horizontal circumference	3	530.33	±	8.22	514.00	540.00
Cranial module	3	156.17	±	2.37	152.83	161.00?
Calculated cranial capacity	3	1505.19	±	48.77	1440.81	1660.70?
Length-breadth index	3	76.72	±	1.18	75.13	79.27?
Length-height index	3	71.82	±	1.16	70.37	74.11
Breadth-height index	3	93.68	±	2.40	89.54?	97.84
Length-auricular height index	1	64.85			—	—
Breadth-auricular height index	1	85.61			—	—
Tr. fronto-parietal index	3	67.13	±	3.35	60.46?	70.86

TABLE 86
ADULT MALE TYPE B₂

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Prosthion-basion line	2	94.50			94.0	95.0
Nasion-prosthion line	3	69.67	±	2.73	66.0	75.0
Nasion-gnathion line	1	116.5			—	—
Bizygomatic breadth	1	136.0			—	—
Nasal height	4	51.88	±	1.52	47.5	54.5
Nasal breadth	3	24.67	±	2.03	21.0	28.0?
Ant. inter-orbital breadth	4	19.50	±	0.46	18.5	20.5
Orbital breadth (right)	3	43.00	±	1.16	41.0	45.0
Orbital breadth (left)	3	39.33	±	0.93	37.5	40.5
Orbital height (right)	3	34.00	±	0.58	33.0	35.0
Orbital height (left)	3	34.67	±	1.01	33.0	36.5
Maxillo-alveolar length	3	54.83	±	2.53	50.0	58.5
Maxillo-alveolar breadth	3	67.50	±	3.89	62.0	75.0
Palatal length	2	46.75			46.0	47.5
Palatal breadth	3	40.50	±	3.76	36.5	48.0

TABLE 86-Continued

Characters	n	Mean	±	S.E.	Min.	Max.
Total facial index	1	85.66			—	—
Superior facial index	1	50.00			—	—
Orbital index (right)	3	79.15	±	1.82	75.56	81.40
Orbital index (left)	3	88.34	±	4.57	82.50	97.33
Nasal index	2	49.50*			47.62	51.38?
Maxillo-alveolar index	3	123.30	±	6.36	111.97	133.93
Palatal index	2	77.12			77.89	79.35

TABLE 87

ADULT MALE TYPE B₂

Mean Indices of the Whole Skull

Characters	n	Mean	±	S.E.	Min.	Max.
Tr. cranio-facial index	1	97.84			—	—
Vert. cranio-facial index	2	52.37			50.00	54.74
Long. cranio-facial index	3	51.12	±	1.07	49.22	52.91
Jugo-frontal index	1	72.43			—	—

TABLE 88

ADULT MALE TYPE B₂

Mean Measurements and Indices of the Mandible

Characters	n	Mean	Min.	Max.
Bigonial breadth	2	79.00	75.5	82.5
Bicondylar breadth	1	112.50?	—	—
Ht. of mandibular ramus	2	62.00	60.0	64.0
Max. breadth of mandibular ramus	2	39.75	39.5	40.0
Min. breadth of mandibular ramus	2	35.00	34.0	36.0
Ht. at mandibular symphysis	2	30.25	28.5	32.0
Mandibular length	2	87.00	83.0	91.0
Mandibular angle	2	110.5°	110°	111°
Mandibular index	1	73.78?	—	—
Breadth index of mandible	1	67.11?	—	—
Jugo-mandibular index	1	55.51	—	—

* Measurements pertaining to nose of Skl. H 502 (G) are not taken into account due to distortion of nasal bones which are likely to vitiate average value.

TABLE 89
ADULT MALE TYPE B₂
Mean Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean	± S.E.	Min.	Max.
Mesiodistal crown diam. of M ₁	3	10.50	± 0.38	10.00	11.25
Labiolingual crown diam. of M ₁	3	11.17	± 0.30	10.75	11.75
Mesiodistal crown diam. of M ₂	3	9.33	± 0.51	8.50	10.25
Labiolingual crown diam. of M ₂	3	10.33	± 0.21	10.00	10.75
Mesiodistal crown diam. of M ₃	3	8.83	± 0.34	8.50	9.50
Labiolingual crown diam. of M ₃	3	10.00	± 0.25	9.50	10.25
Crown index of M ₁	3	106.81	± 6.35	95.55	117.50
Crown index of M ₂	3	111.79	± 8.22	98.08	126.47
Crown index of M ₃	3	113.92	± 6.92	100.00	121.18

TABLE 90
ADULT MALE TYPE B₂
Mean Measurements and Indices of the Permanent Mandibular Molar Teeth

Characters	n	Mean	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.75	10.50	11.00
Labiolingual crown diam. of M ₁	2	10.12	9.75	10.50
Mesiodistal crown diam. of M ₂	2	9.50	9.25	9.75
Labiolingual crown diam. of M ₂	2	9.00	9.00	9.00
Mesiodistal crown diam. of M ₃	2	10.25	10.00	10.50
Labiolingual crown diam. of M ₃	2	8.88	8.75	9.00
Crown index of M ₁	2	94.16	92.86	95.45
Crown index of M ₂	2	94.87	92.37	97.37
Crown index of M ₃	2	86.82	86.14	87.50

TABLE 91
ADULT MALE COMBINED
Statistical Constants of the Measurements and Indices of the Neurocranium

Characters	n	Mean	± S.E.	S. D.	C. V.	Min.	Max.
Max. cranial length	5	189.10	± 1.58	3.54	1.87	183.5	193.0
Max. cranial breadth	3	144.67	± 4.26	7.37	5.09	139.0	153.0?
Nasion-Inion length	4	176.50	± 2.87	5.74	3.25	170.0	184.0
Basion-bregma height	5	134.80	± 0.80	1.79	1.33	133.0	137.0
Min. frontal breadth	4	95.75	± 1.88	3.77	3.91	92.5	99.5

TABLE 91 - Continued

Characters	n	Mean \pm	S.E.	S. D.	C. V.	Min.	Max.
Vertical porion height	1	119.00			—	—	—
Median sagittal arc	3	382.00 \pm	5.51	9.54	2.50	372.0	391.0
Vertical transversal arc	1	318.00			—	—	—
Horizontal circumference	3	530.33 \pm	8.22	14.22	2.68	514.0	540.0
Cranial module	3	156.17 \pm	2.48	4.29	2.75	152.83	161.00?
Calculated cranial capacity	3	1505.19 \pm	48.77	84.37	5.61	1440.81	1660.70
Length-breadth index	3	76.72 \pm	1.29	2.23	2.91	75.13	79.27
Length-height index	4	71.54 \pm	0.86	1.73	2.42	70.37	74.11
Breadth-height index	3	95.61 \pm	2.40	4.15	4.43	89.54?	97.84
Length-auricular height index	1	93.68		—	—	—	—
Breadth-auricular height index	1	64.85		—	—	—	—
Tr. fronto-parietal index	3	67.13 \pm	3.35	5.79	8.63	60.46?	70.86

TABLE 92

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of the Splanchnocranium

Characters	n	Mean \pm	S.E.	S. D.	C. V.	Min.	Max.
Prosthion-basion line	5	96.60 \pm	1.40	3.13	3.24	94.0	100.0
Nasion-prosthion line	5	70.30 \pm	1.56	3.49	4.96	66.0	75.0
Nasion-gnathion line	2	116.25		—	—	116.0	116.5
Bizygomatic breadth	1	136.0		—	—	—	—
Nasal height	6	52.67 \pm	1.10	2.70	5.13	47.5	55.0
Nasal breadth	6	25.50 \pm	1.03	2.53	9.92	21.0	28.0?
Ant. inter-orbital breadth	6	19.75 \pm	0.56	1.37	6.94	18.5	22.0
Orbital breadth (right)	5	41.90 \pm	1.00	2.25	5.37	39.0	45.0
Orbital breadth (left)	4	40.62 \pm	1.45	2.90	7.14	37.5	44.5
Orbital height (right)	4	33.25 \pm	0.86	1.71	5.41	31.0	35.0
Orbital height (left)	4	34.50 \pm	0.74	1.47	4.26	33.0	36.5
Maxillo-alveolar length	6	55.08 \pm	1.36	3.32	6.03	50.0	58.5
Maxillo-alveolar breadth	6	65.75 \pm	2.02	4.96	7.54	62.0	75.0
Palatal length	5	46.80 \pm	0.96	2.14	4.57	43.5	49.0
Palatal breadth	6	39.08 \pm	2.14	5.25	13.43	32.5	48.0
Total facial index	1	85.66		—	—	—	—
Superior facial index	1	50.00		—	—	—	—
Orbital index (right)	4	79.24 \pm	1.28	2.57	3.24	75.56	81.40
Orbital index (left)	4	85.36 \pm	4.40	8.79	10.30	76.40	97.33
Nasal index	5	47.64 \pm	1.30	2.92	6.13	44.21	51.38?
Maxillo-alveolar index	6	119.53 \pm	3.51	8.60	7.19	110.53	133.93
Palatal index	5	79.88 \pm	3.78	8.46	10.59	67.71	90.80

TABLE 93

ADULT MALE COMBINED

Statistical Constants of the Indices of the Whole Skull

Characters	n	Mean \pm	S.E.	S. D.	C. V.	Min.	Max.
Tr. cranio-facial index	1	97.84		—	—	—	—
Vert. cranio-facial index	3	52.32 \pm	1.37	2.37	4.53	50.00	54.74
Long. cranio-facial index	4	50.64 \pm	0.90	1.79	3.53	49.21	52.91
Jugo-frontal index	1	72.43		—	—	—	—

TABLE 94

ADULT MALE COMBINED

Statistical Constants of the Mandibular Measurements and Indices

Characters	n	Mean	Min.	Max.
Bigonial breadth	2	79.00	75.5	82.5
Bi-condylar breadth	1	112.5?	—	—
Ht. of mandibular ramus	2	62.00	60.0	64.0
Max. breadth of mandibular ramus	2	39.75	39.5	40.0
Min. breadth of mandibular ramus	2	35.00	34.0	36.0
Ht. at mandibular symphysis	2	30.25	28.5	32.0
Mandibular length	2	87.00	83.0	91.0
Mandibular angle	2	110.5°	110°	111°
Mandibular index	1	73.78?	—	—
Breadth index of mandible	1	67.11?	—	—
Jugo-mandibular index	1	55.51	—	—

TABLE 95

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean \pm	S.E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	6	10.12 \pm	0.27	0.65	6.42	9.25	11.25
Labiolingual crown diam. of M ₁	6	11.21 \pm	0.22	0.54	4.82	10.75	12.00
Mesiodistal crown diam. of M ₂	6	9.25 \pm	0.25	0.61	6.59	8.50	10.25
Labiolingual crown diam. of M ₂	6	10.54 \pm	0.18	0.44	4.17	10.00	11.25
Mesiodistal crown diam. of M ₃	6	8.75 \pm	0.20	0.50	5.71	8.25	9.50
Labiolingual crown diam. of M ₃	6	10.00 \pm	0.20	0.50	5.00	9.50	10.75
Crown index of M ₁	6	111.16 \pm	3.69	9.04	8.13	95.55	120.30
Crown index of M ₂	6	114.74 \pm	4.62	11.31	9.86	98.08	128.60
Crown index of M ₃	6	115.06 \pm	4.66	11.41	9.92	100.00	131.11

TABLE 96
ADULT MALE COMBINED
Statistical Constants of the Measurements and Indices of Permanent Mandibular Molar Teeth

Characters	n	Mean	S.E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	3	10.75 ±	0.14	0.24	2.23	10.50	11.00
Labiolingual crown diam. of M ₁	3	10.08 ±	0.21	0.37	3.67	9.75	10.50
Mesiodistal crown diam. of M ₂	3	9.92 ±	0.44	0.76	7.66	9.25	10.75
Labiolingual crown diam. of M ₂	3	9.25 ±	0.24	0.42	4.54	9.00	9.75
Mesiodistal crown diam. of M ₃	4	10.25 ±	0.14	0.28	2.73	10.00	10.50
Labiolingual crown diam. of M ₃	4	8.94 ±	0.21	0.42	4.70	8.50	9.50
Crown index of M ₁	3	93.76 ±	0.85	1.47	1.57	92.86	95.45
Crown index of M ₂	3	93.51 ±	1.98	3.43	3.67	90.80	97.37
Crown index of M ₃	4	87.28 ±	1.18	2.37	2.72	85.00	90.48

TABLE 97
ADULT FEMALE TYPE A
Mean Measurements and Indices of the Neurocranium

Characters	n	Mean
Max. cranial length	1	183.50
Max. cranial breadth	1	132.00
Nasion-inion length	1	134.00
Basion-bregma height	1	167.00
Min. frontal breadth	1	94.00
Vertical porion height	1	110.00
Median sagittal arc	1	376.00
Vertical transversal arc	1	297.00
Horizontal circumference	1	505.00
Cranial module	1	149.83
Calculated cranial capacity	1	1298.21
Length-breadth index	1	71.93
Length-height index	1	73.02
Breadth-height index	1	101.52
Length-auricular height index	1	59.95
Breadth-auricular height index	1	83.33
Tr. fronto-parietal index	1	71.21

TABLE 98
ADULT FEMALE TYPE A
Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean
Nasal height	1	39.00
Nasal breadth	1	26.00

TABLE 98 - Continued

Characters	n	Mean
Ant. inter-orbital breadth	1	18.00
Orbital breadth (right)	1	42.00
Orbital breadth (left)	1	40.00
Orbital height (right)	1	31.00
Orbital height (left)	1	30.00
Palatal length	1	44.00
Palatal breadth	1	34.50
Orbital index (right)	1	73.81
Orbital index (left)	1	75.00
Nasal index	1	66.67
Palatal index	1	78.41

TABLE 99
ADULT FEMALE TYPE A₁
Mean Measurements and Indices of the Mandible

Characters	n	Mean
Bilgonial breadth	1	84.00
Ht. of mandibular ramus	1	54.50
Max. breadth of mandibular ramus	1	45.00
Min. breadth of mandibular ramus	1	35.00
Ht. at mandibular symphysis	1	29.50
Mandibular length	1	74.00
Mandibular angle	1	121°

TABLE 100

ADULT FEMALE TYPE A

Mean Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₂	1	10.00
Labiolingual crown diam. of M ₂	1	9.00
Mesiodistal crown diam. of M ₃	1	8.00
Labiolingual crown diam. of M ₃	1	9.50
Crown index of M ₂	1	90.00
Crown index of M ₃	1	118.75

TABLE 101

ADULT FEMALE TYPE A

Mean Measurements and Indices of the Permanent Mandibular Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₂	1	10.00
Labiolingual crown diam. of M ₂	1	10.00
Crown index of M ₂	1	100.00

TABLE 102

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	Min.	Max.
Max. cranial length	2	185.50	177.0	194.0
Nasion-inion length	1	163.0	—	—
Min. frontal breadth	1	95.0	—	—
Horizontal circumference	1	492.0	—	—

TABLE 103

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean
Nasion-prosthion line	1	69.0
Nasion-gnathion line	1	121.5
Nasal height	1	49.5

TABLE 103-Continued

Characters	n	Mean
Nasal breadth	1	26.0
Ant. inter-orbital breadth	1	21.0
Orbital breadth (left)	1	37.5
Orbital height (left)	1	35.5
Maxillo-alveolar length	1	58.0
Maxillo-alveolar breadth	1	62.5
Palatal length	1	48.5
Palatal breadth	1	33.0
Orbital index (left)	1	94.67
Nasal index	1	52.53
Maxillo-alveolar index	1	107.76
Palatal index	1	68.04

TABLE 104

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of the Mandible

Characters	n	Mean
Max. breadth of mandibular ramus	1	37.0
Min. breadth of mandibular ramus	1	30.0
Ht. at mandibular symphysis	1	34.0
Mandibular length	1	75.0

TABLE 105

ADULT FEMALE TYPE A₁

Mean Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₁	1	10.00
Labiolingual crown diam. of M ₁	1	10.25
Mesiodistal crown diam. of M ₂	1	8.50
Labiolingual crown diam. of M ₂	1	11.25
Mesiodistal crown diam. of M ₃	1	9.00
Labiolingual crown diam. of M ₃	1	10.00
Crown index of M ₁	1	102.50
Crown index of M ₂	1	132.64
Crown index of M ₃	1	111.11

TABLE 106

ADULT FEMALE TYPE A₁Mean Measurements and Indices of the Permanent
Mandibular Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₁	1	10.25
Labiolingual crown diam. of M ₁	1	10.25
Mesiodistal crown diam. of M ₂	1	9.75
Labiolingual crown diam. of M ₂	1	10.00
Mesiodistal crown diam. of M ₃	1	10.00
Labiolingual crown diam. of M ₃	1	9.75
Crown index of M ₁	1	100.00
Crown index of M ₂	1	102.76
Crown index of M ₃	1	97.50

TABLE 108

ADULT FEMALE TYPE B₂

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean
Prosthion-basion line	1	100.00
Nasion-prosthion line	1	58.00
Nasion-gonathion line	1	106.00
Bizygomatic breadth	1	115.00
Nasal height	1	43.50
Nasal breadth	1	23.00
Ant. inter-orbital breadth	1	15.00
Orbital breadth (right)	1	41.50
Orbital breadth (left)	1	41.50
Orbital height (left)	1	38.00
Total facial index	1	92.17
Superior facial index	1	59.43
Orbital index (left)	1	91.57
Nasal index	1	52.87

TABLE 109

ADULT FEMALE TYPE B₂

Mean Indices of the Whole Skull

Characters	n	Mean
Tr. cranio-facial index	1	35.82
Vert. cranio-facial index	1	12.96
Long. cranio-facial index	1	59.88
Jugo-frontal index	1	78.26

TABLE 107

ADULT FEMALE TYPE B₂

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean
Max. cranial length	1	167.00
Max. cranial breadth	1	134.00
Nasion-inion length	1	166.00
Basion-bregma height	1	135.00
Min. frontal breadth	1	90.00
Vertical porion height	1	109.00
Cranial module	1	145.33
Calculated cranial capacity	1	1204.52
Length-breadth index	1	83.24
Length-height index	1	80.84
Breadth-height index	1	100.75
Length-auricular height index	1	65.27
Breadth-auricular height index	1	81.34
Tr. fronto-parietal index	1	67.16

TABLE 110

ADULT FEMALE TYPE B₂

Mean Measurements and Indices of the Mandible

Characters	n	Mean
Bigonial breadth	1	79.0
Min. breadth of mandibular ramus	1	30.0
Ht. at mandibular symphysis	1	29.0
Mandibular length	1	70.0
Jugo-mandibular index	1	68.70

TABLE 111

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S.E.	S. D.	C. V.	Min.	Max.
Max. cranial length	5	181.90	±	4.64	10.39	5.71	167.0	194.0
Max. cranial breadth	2	133.00			—	—	132.0?	134.0
Nasion-inion length	3	165.33	±	1.20	2.08	1.26	163.0	167.0
Basion-bregma height	2	134.50			—	—	134.0	135.0
Min. frontal breadth	3	93.00	±	1.53	2.65	2.85	90.0	95.0
Vertical porion height	2	109.50			—	—	109.0	110.0
Median sagittal arc	1	376.00			—	—	—	—
Vert. transversal arc	1	297.00			—	—	—	—
Horizontal circumference	2	498.50			—	—	492.0	505.0?
Cranial module	2	147.58			—	—	145.33	149.83?
Calculated cranial capacity	2	1251.36			—	—	1204.52	1298.21?
Length-breadth index	2	76.08			—	—	71.93	80.24
Length-height index	2	76.93			—	—	73.02	80.84
Breadth-height index	2	101.14			—	—	100.75	101.52?
Length-auricular height index	2	62.61			—	—	59.95	65.27
Breadth-auricular height index	2	82.34			—	—	81.34	83.33?
Tr. fronto-parietal index	2	69.18			—	—	67.16	71.21?

TABLE 112

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S.E.	S. D.	C. V.	Min.	Max.
Prosthion-basion line	2	100.00			—	—	100.0	100.0
Nasion-prosthion line	3	66.00	±	4.05	7.00	10.61	58.0	71.0
Nasion-gnathion line	3	116.17	±	5.09	8.81	7.58	106.0	121.5
Bi-zygomatic breadth	2	117.50			—	—	115.0	120.0?
Nasal height	5	45.80	±	2.14	4.80	10.48	39.0	51.0
Nasal breadth	4	24.00	±	1.22	2.45	10.21	21.0	26.0
Ant. inter-orbital breadth	5	18.20	±	0.97	2.17	11.92	15.0	21.0
Orbital breadth (right)	4	40.50	±	0.89	1.78	4.40	38.0	42.0
Orbital breadth (left)	5	40.60	±	0.87	1.95	4.80	37.5	42.5
Orbital height (right)	3	33.17	±	1.49	2.57	7.75	31.0	36.0
Orbital height (left)	4	33.62	±	1.88	3.77	11.21	30.0	38.0
Maxillo-alveolar length	2	57.75			—	—	57.5	58.0
Maxillo-alveolar breadth	3	61.33	±	1.17	2.02	3.29	59.0	62.5
Palatal length	3	46.83	±	1.43	2.47	5.27	44.0?	48.5

TABLE 112-Continued

Characters	n	Mean	\pm	S.E.	S. D.	C. V.	Min.	Max.
Palatal breadth	4	35.25	\pm	0.97	1.94	5.50	33.0	37.50
Total facial index	2	96.50			—	—	92.17	100.83
Superior facial index	2	54.80			—	—	50.43	59.17?
Orbital index (right)	3	82.74	\pm	4.58	7.92	9.57	73.81	88.89
Orbital index (left)	4	83.54	\pm	5.58	11.16	13.36	72.94	94.67
Nasal index	4	53.31	\pm	5.22	10.43	19.56	41.18	66.67
Maxillo-alveolar index	2	108.23			—	—	107.76	108.70
Palatal index	3	74.86	\pm	3.42	5.91	7.89	68.04	78.41?

TABLE 113

ADULT FEMALE COMBINED

Statistical Constants of the Indices of the Whole Skull

Characters	n	Mean
Tr. cranio-facial index	1	85.82
Vert. cranio-facial index	1	42.96
Long. cranio-facial index	1	59.88
Jugo-frontal index	1	78.26

TABLE 114

ADULT FEMALE COMBINED

Statistical Constants of the Mandibular Measurements and Indices

Characters	n	Mean	\pm	S.E.	S. D.	C. V.	Min.	Max.
Bigonial breadth	4	83.62	\pm	1.84	3.68	4.40	79.00	88.00
Bicondylar breadth	2	111.5			—	—	111.00	112.00
Ht. of mandibular ramus	4	57.75	\pm	1.74	3.48	6.03	54.5	62.25
Max. breadth of mandibular ramus	5	41.50	\pm	1.30	2.92	7.04	37.00	45.00
Min. breadth of mandibular ramus	6	31.67	\pm	1.09	2.66	8.40	29.00	35.50
Ht. at mandibular symphysis	7	30.00	\pm	1.04	2.75	9.17	25.00	34.00
Mandibular length	7	74.71	\pm	1.95	5.18	6.93	67.5	81.50
Mandibular angle	4	122.62°	\pm	0.98	1.97	1.61	121.00°	125.00°
Mandibular index	2	66.79			—	—	60.81	72.77
Breadth index of mandible	2	76.92			—	—	74.55	79.28
Jugo-mandibular index	2	69.14			—	—	68.70	69.58?

TABLE 115

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	±	S.E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	3	9.92	±	0.51	0.88	8.87	9.00	10.75
Labiolingual crown diam. of M ₁	3	11.08	±	0.42	0.72	6.50	10.25	11.50
Mesiodistal crown diam. of M ₂	4	9.62	±	0.42	0.85	8.84	8.50	10.50
Labiolingual crown diam. of M ₂	4	10.19	±	0.47	0.94	9.22	9.00	11.25
Mesiodistal crown diam. of M ₃	4	8.75	±	0.48	0.96	10.97	8.00	10.00
Labiolingual crown diam. of M ₃	4	9.62	±	0.24	0.48	4.99	9.00	10.00
Crown index of M ₁	3	112.44	±	7.79	13.48	11.99	102.50	127.78
Crown index of M ₂	4	107.25	±	9.58	19.16	17.86	90.00	132.64
Crown index of M ₃	4	110.59	±	3.90	7.80	7.05	100.00	118.75

TABLE 116

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Permanent Mandibular Molar Teeth

Characters	n	Mean	±	S.E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.25			—	—	10.25	10.25
Labiolingual crown diam. of M ₁	2	10.25			—	—	10.25	10.25
Mesiodistal crown diam. of M ₂	3	9.75	±	0.14	0.24	2.46	9.50	10.00
Labiolingual crown diam. of M ₂	3	9.83	±	0.16	0.28	2.85	9.50	10.00
Mesiodistal crown diam. of M ₃	2	9.50			—	—	9.00	10.00
Labiolingual crown diam. of M ₃	2	9.12			—	—	8.50	9.75
Crown index of M ₁	2	100.00			—	—	100.00	100.00
Crown index of M ₂	3	101.11	±	0.84	1.46	1.44	100.00	102.76
Crown index of M ₃	2	95.97			—	—	94.44	97.50

CEMETERY H STRATUM I (JAR BURIALS)

The skeletal remains of 78 individuals were found in Cemetery H Stratum I (Jar burials), but it was possible to examine only 18 skulls for our purpose. The dimensions relating to the length, width and height of the skulls are given in Collective Tables D—E and their morphological observations in those of J—K.

A. CRANIA

SKL. H 206 (B)

It is undoubtedly a male adult; large mastoid processes, strong muscular attachments are masculine features. The skull is incomplete. Nearly the whole of the forehead and part of the right parietal and temporal regions are missing. Both the orbits and nasal bones are somewhat deformed due to the pressure of earth, but most of the measurements are definite. Seen from above, the skull is almost *ovoides* with protruding *tubera parietalia*. From the side, the skull appears to be well vaulted and the occipital curve is rounded. The skull is mesocranic, the length-breadth index being 76.67. The palate is broad and evenly *parabolic*.

All the teeth have erupted and show considerable abrasion, the upper second left permanent molar being lost *post mortem*.

SKL. H 255 (a) [Fig. 97; Pl. LXVII : 1-2]

Adult male, fairly old in age. The skull is in a good state of preservation. Sagittal and coronal sutures are fully closed. Supraorbital ridges are strongly developed, muscular attachments well marked and mastoids moderately big. The occiput shows a pronounced nuchal line. Norma verticalis appears to be an elongated oval. Norma lateralis shows a very prominent glabello-superciliary region, concave nasal ridge and deep nasion. The forehead ascends little inclined up to the metopion and turns abruptly into a flat vertex which slopes obliquely down to a protruding occiput. There is also evidence of some amount of subnasal prognathism, and the meatus lies nearly midway between nasion and inion. In front view, the upper face is of medium height and breadth, the superior facial index being 54.20 (mesen). Orbits are mesoconchal (right OI 80.00 and left OI 77.01) in form with

a tendency towards chameconchal type, whereas nasal aperture is short and wide, hence chamaerrhine (NI. 52.94). The skull is hyperdolichocranic (L-B Index 68.18), orthocranic (L-AH Index 59.60) and acrocranic (B-AH Index 87.41). Palate is short, *paraboloid* in shape and molars are highly eroded. The mandibular fossae are fairly deep.

The lower jaw is well formed with prominent chin. Ramus fairly low and of medium breadth, the minimum breadth of the ascending ramus being 34.5 mm. The body of the mandible is of medium height, the height measured at the site of the second molar is 28 mm. The mandibular angle formed by the posterior border of the ramus and the lower margin of the corpus is 117° . The internal pterygoid insertion area forms a deep and extensive concavity. All the teeth have erupted and chewing surface of the molars show considerable attrition.

SKL. H 344 [Fig. 98; Pis. XLII, XLIII, XLVIII]

The skull is of an adult male, fairly old in age as judged from the absorption of the upper alveolar margin. Supraorbital ridges are usually prominent muscular attachments well developed and mastoid processes excessively large. In norma verticalis, the skull is *ovoid* with some bulging at the parietals. Norma lateralis shows massing of bone at glabella, short and concave nasal ridge, depressed nasal root and slight degree of subnasal prognathism. The forehead is little inclined and the sagittal contour not so well arched. The occiput is prominent but more rounded. Norma facialis shows a moderately wide and low upper face, the superior facial index being 44.12 (hypereuryrn). Orbits are low and mesoconchal in form, whereas nose is broad with an index of 57.45 (hyperchamaerrhine). The skull is mesocranic (L-B Index 76.63), orthocranic (L-H Index 73.91) and metriocranic (B-H Index 96.45).

Mandible is incomplete and somewhat distorted. The ascending rami are not preserved and broken off little above the gonial angles. Two molars, two premolars and canine are present on the right side; on the left side are the roots of two incisors. Teeth are worn flat about half the way through the tooth structure proper, the wear being greatest on the buccal side.

SKL. H 61

The skull is very much distorted and compressed. Greater portion of the face including nasal bones, glabellar and inter-orbital regions are defective. The frontal bone is pressed in. The occipito-mastoid region is distorted on the left side. There is an opening in the left parietal, measures 37 mm from before backwards and 25 mm from above downwards.

The skull is small in size and globular in form. The vertical porion height is 117 mm. Compared to size of the skull, slight increase in the vertical porion height is due to occipito-mastoid having been compressed and pushed upwards a few millimeters. The right orbit is squarish and mesoconchal (OI 80.95) in form.

SKL. H 153 (a)

The skull is not well preserved and only a few measurements could be taken accurately. Portion of the frontal bone, upper alveolar margin with all the teeth are missing. Orbits are compressed from above downwards and left parieto-temporal area shows some amount of sidewise compression. Similarly due to pressure, bones of the base have been forced slightly upwards and inwards. The length of the skull is 181 mm. In comparison with length and width the height of the skull appears to be low, the basion-bregma height being about 117 mm, the distorted base making an exact estimate impossible. The forehead is vertical and narrow (minimum frontal breadth 89 mm). The cranial contour in norma verticalis is *byrsoides* in shape.

SKL. H 154 (a) [Pl. XLIX]

It is an adult female. The skull is incomplete and rather small and gracile in structure. The entire sphenoid bone and the lower border of right orbit are missing. The maxilla lacks the left posterior portion and associated teeth; it retains a right PM₂, right M₂ and M₃. In norma verticalis the skull is more or less ellipsoidal in shape, the forehead relatively narrow, parietal eminences being somewhat prominent. From the side, the forehead ascends in a smooth arc into a convex vertex which slopes obliquely down to a prominent *tuber occipitale*. The facial region is moderately narrow and supraorbital ridges absent. The skull is dolichocranic (L-B Index 72.73), hypsicranic (L-H Index 78.98) and acrocranic (B-H Index 108.59). Its cranial capacity is 1300.50 cc.

Mandible is incomplete. Nearly whole of the left half is missing. It is gracile in general appearance. Muscular markings are mildly developed. The mandibular length is 88 mm and the gonial angle seems to be evenly rounded. Minimum breadth of the ascending ramus measures 34 mm. The vertical depth of the horizontal ramus in the region of second molar is 26 mm.

SKL. H 206 (d) [Pl. LXVII : 3-4]

The skull belongs to an adult female, between 25 and 30 years of age. It is incomplete having a broken mandible. Supraorbital ridges are only perceptible mesially with feeble muscular impression. Basilar suture is closed while vault sutures are open. Viewing from the top it is *ovoides* in outline, expanded at the parietals. From the side, the forehead is slightly receding passing back in a uniform curve into the general contour of the vault; the occipital region is slightly protruding. The skull is mesocranic (L-B Index 76.88), chamaecranic (L-H Index 72.25) and metriocranic (B-H Index 93.98). The face is low in relation to its width. Orbits are somewhat rectangular and chamaeconchic (left OI 75.90). The nose is broad and short in length being hyperchamaerrhine (NI 65.12) and not sunken at the root. The nasal profile is more or less concave and the bones are narrow-constricted. A very small degree of subnasal prognathism could be noticed. Palatal region is broken. Occipital foramen is rhomboid in outline. Cranial capacity is 1260.68 cc. According to Dupertuis and Hadden's formulae the stature is about 152.69 cm, and about 148.31 cm according to Pearson.

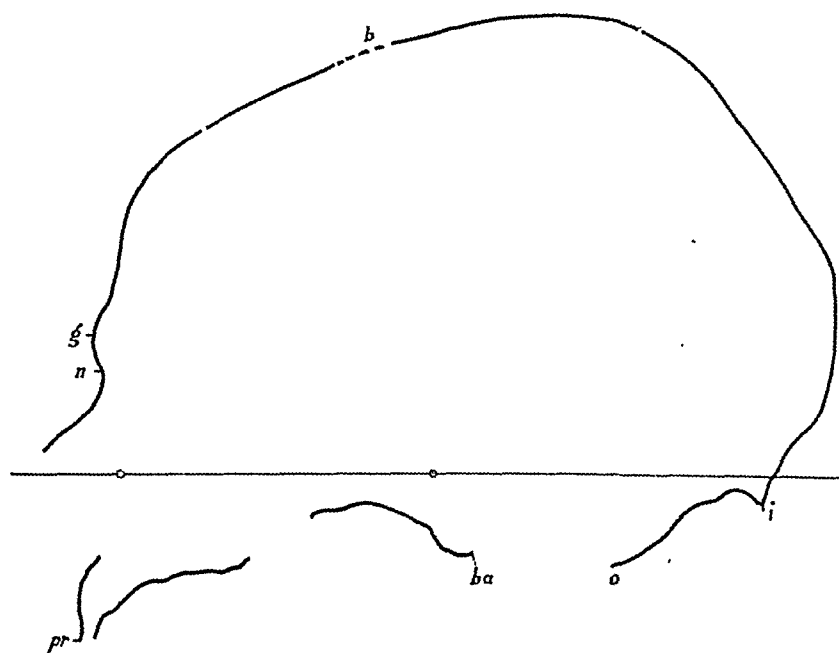


Fig. 97, Skl. H 255 (a)

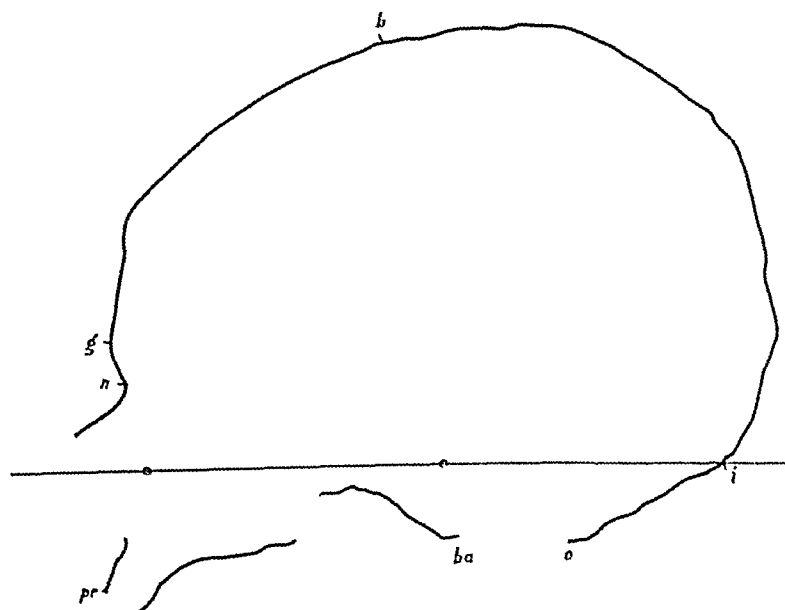


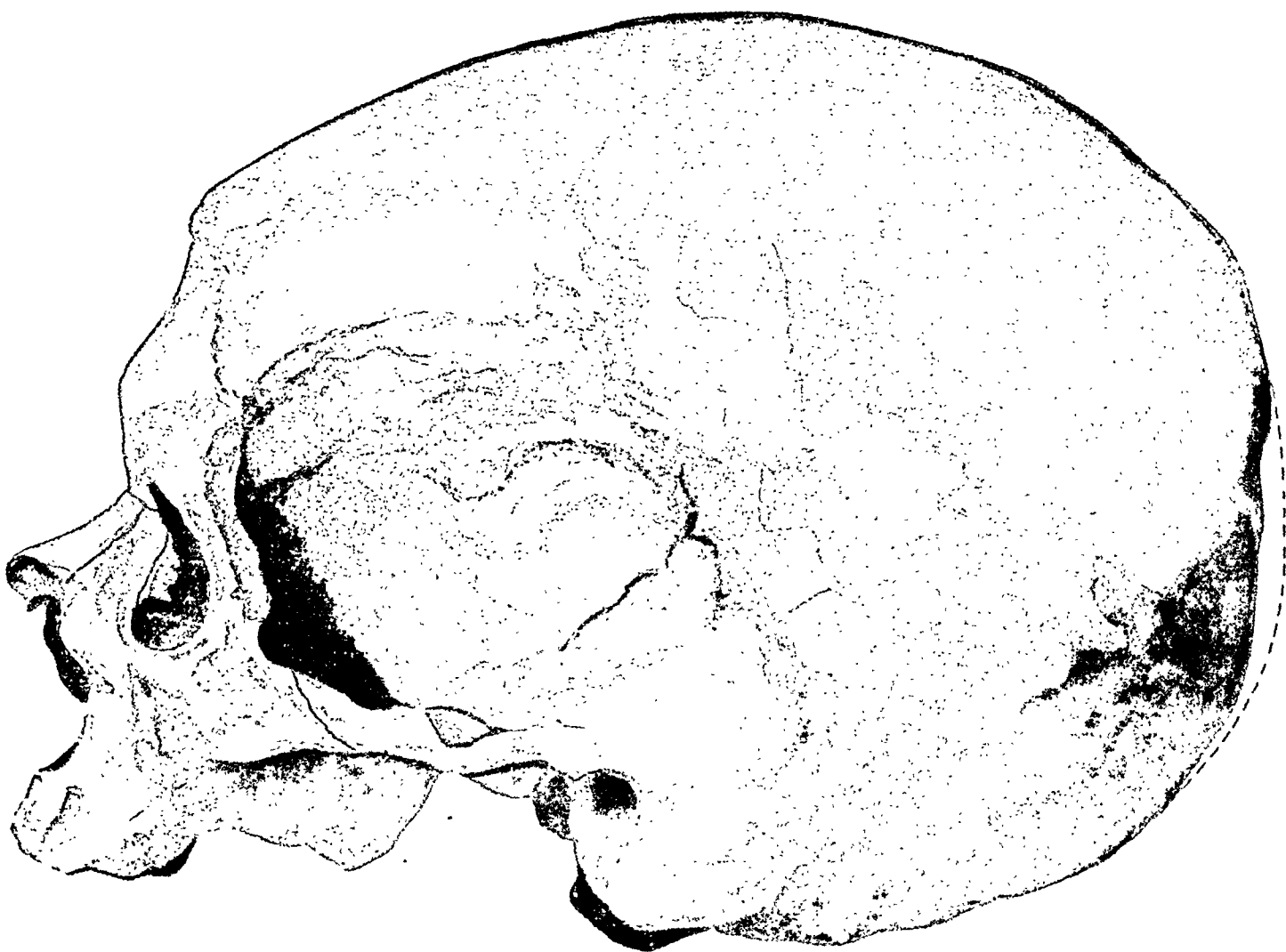
Fig. 98 Skl. H 311

MID-SAGITTAL CURVE ($\frac{1}{2}$ NATURAL SIZE)

HUMAN REMAINS FROM HARAPPA
GUPTA, DUTTA & BASU



Norma Frontalis



Norma Lateralis

DIOPTOGRAPH TRACING (WASH) : SKL. H 344 (Slightly Reduced)

Mandible is medium in size with little muscular markings. Mylohyoid ridge and pterygoid attachments are indistinct. Both the ascending rami are not preserved, the right ascending ramus including portion of the mandibular body is missing. The ascending ramus is not very high (50.5 mm) and wide (30 mm). The mandibular angle is rounded (123°).

SKL. H 245 (c) [Pl. 11]

The skull is incomplete (but reconstructed) and lacks nearly entire basis cranii, both the zygomatic arches, part of the frontal bone including supraorbital margins and nasal bones. The whole cranial surface is very much eroded. The sex is difficult to determine but the extremity bones are rather gracile in structure. It is therefore assumable that the skull belongs to a female. The age

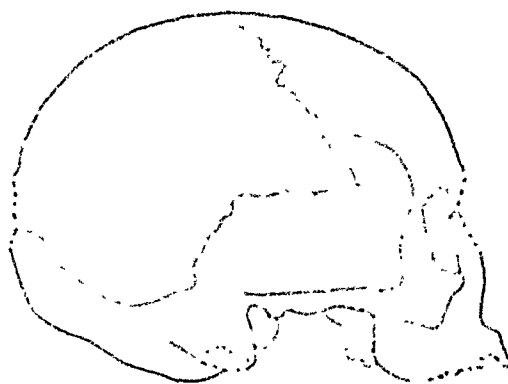


Fig. 99

appears to be fairly high : most of the portion of sagittal suture is ossified. Norma verticalis is wide ovoid, narrowed in front. In norma temporalis the frontal bone ascends obliquely and passes into a somewhat domed vertex. The occiput is fairly rounded with no actual protuberance. The cranial index is 84.00, which places it within the brachyranic or broad-headed class.

SKL. H 246 (c) [Pl. 102]

The skull belongs to an adult female. Supraorbital ridges are median in type, muscle attachments rather small and left mastoid process is small in size. The right zygomatic process, greater part of the maxillae and palate are missing. Norma verticalis is *pentagonoid* with prominent parietal eminences. In norma temporalis the forehead is low and practically vertical to about metopion when it slopes back posteriorly into a low-arched vertex. The occiput is curved with a fairly prominent *tuber occipitale*. Norma occipitalis is house shaped with sides converging slightly downwards. The nasal ridge is short and concave with a slight depression at the root. The skull is dolichocranic (L-B Index 74.18), orthocranic (L-AH Index 60.99) and metriocranic (B-AH Index 82.22). Intracranial capacity is 1324.35 cc.

SKL. H 247 (a)

Adult skull, between 21 and 25 years. Posterior part of the basis cranii is absent and the skull is flattened at the left side. Low supraorbital ridges and small mastoids suggest it to be a female. All the cranial sutures are open. Viewed from the top, the skull is sphenoides in shape and the right zygomatic arch slightly bowed out while left is broken. The skull appears to be elongated but the cranial index could not be worked out due to absence of landmarks for breadth measurement. It is orthocranic in both the indices (L-H Index 73.86 and L-AH Index 61.65). Forehead is receding and from ophryon it passes backwards. The proportion of length and breadth of the face is middle, superior facial index being mesen (53.36). The right orbit is mesoconchic (OI 79.52). The nose is flat and chamaerrhine (NI 54.17). Subnasal protuberance is marked with muzzle-shaped alveolar region. The palate is deep and narrow and *upsiloid* in shape.

SKL. H 247 (b) [Pl. LXVI]

The skull is that of an adult female. The cranial sutures are open and comparatively simple. Main parts missing are, the occipital portion of the base, frontal process of the left maxilla, left malar and much of the alveolar margins.

The skull is relatively small in size and shows minimum of bony relief. The cranial capacity is estimated to have been 1253.44 cc. The vault is moderately low (the vertical porion height being 108 mm) ; while the cranial index is in the border of dolicho- and mesocranic (L-B Index 74.72). The supraorbital ridges are feeble, and the forehead is narrow and almost vertical. Nasal bones are wing-shaped with a little or no depression of the nasal root. The upper face height, from nasion to prosthion, measures 60 mm only.

SKL. H 7435 (b) [Figs. 100, 101]

The skull belongs to an adult female, aged approximately 25 years. The right temporo-parietal region is somewhat compressed, the glabellar portion of the forehead including the upper part of the nasal bones is damaged, while the zygomatic arches are entirely missing. All the cranial sutures

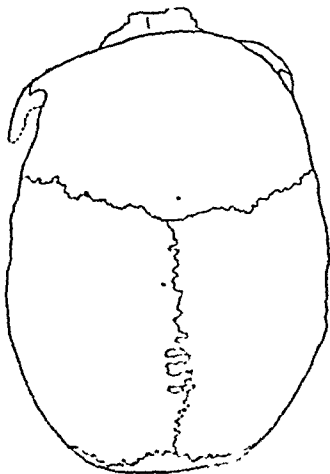


Fig. 100

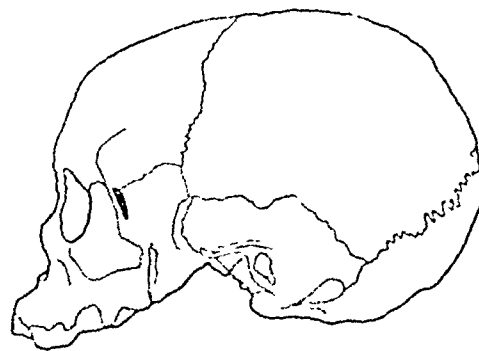


Fig. 101

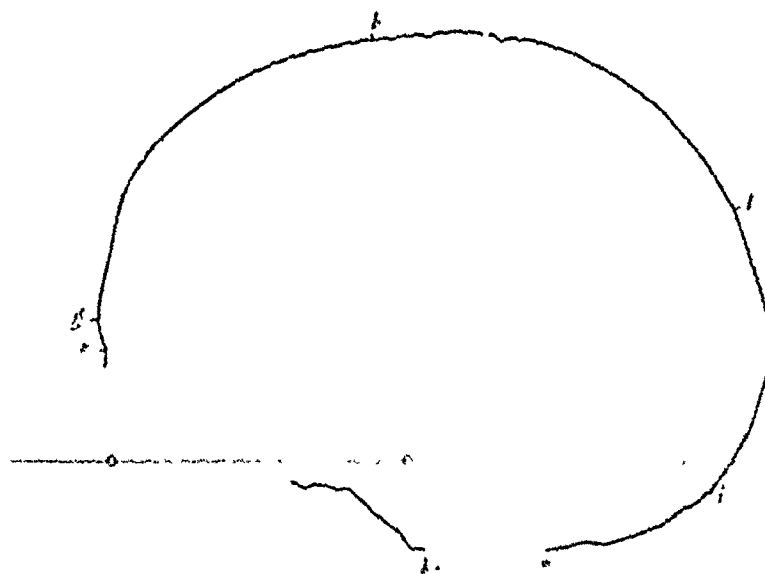


Fig. 102 Skl. Pot No. 10

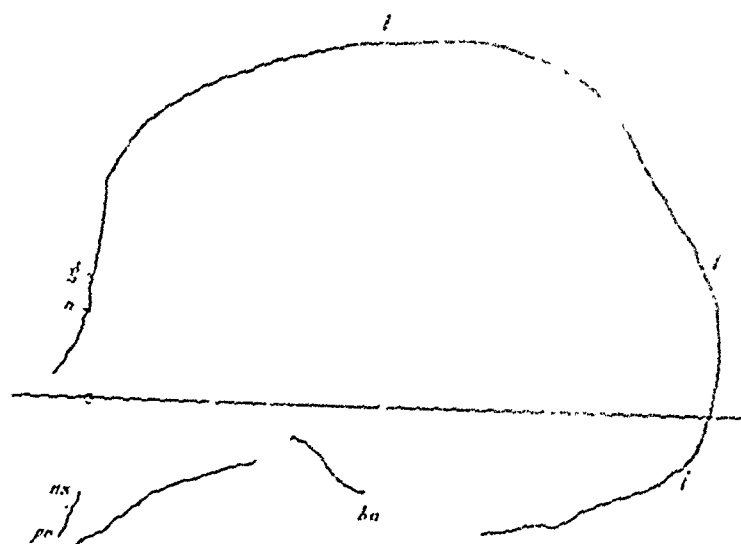


Fig. 103 Skl. Pot No. 11

MID-SAGITTAL CURVE ($\frac{1}{2}$ NATURAL SIZE)

are open. Muscular attachments and mastoids are weakly developed. The same is true of supra-orbital ridges. When viewed from top, the skull is almost *ellipsoidal* with slightly expanded parietal eminences. Viewed from the side, the forehead is slightly inclined and passes back into a somewhat flat vertex. The vault of the skull is strikingly low as shown by the auricular height of the skull (100.00 mm). There appears to be a small pre-lambdoid flattening, and an occipital bun is moderately discernible. There is also some amount of sub-nasal prognathism. The maximum cranial length is 178.0 mm, the right parietal region is slightly compressed so that length-breadth index cannot be derived accurately ; but the skull is certainly dolichocranic. The length-auricular height proportion is within the chamaecranic category, with an index of 56.18. The orbits are rectangular, inclined laterally downwards, and chamaeconchic.

SKL. Pot No. 11 Fig. [103]

The calvaria is small and practically devoid of *post-mortem* defects. Supraorbital ridges are indistinct, mastoid processes small and the muscle attachment weak. All the cranial sutures are open but spheno-basilar is united. This, together with the state of dentition suggests that the skull belongs to an adult female about 25 years of age. In *norma verticalis* the skull is an elongated oval, slightly expanded at the parietals. Seen from the side, the forehead rises almost vertically, but from the ophryon sweeps back into relatively low arched vertex with a small pre-lambdoid flattening. The occiput is convex with a moderately protruding *tuber occipitale*. Nasion is not deep and the nasal ridge short and concave. In front view, the upper face is of medium breadth, the superior facial index being 52.00 (mesen) and nose is mesorrhine with an index of 48.48. The skull is mesocranic (L-B Index 75.72) and orthocranic (L-AH Index 59.54).

SKL. Pot No. 12 (a) [Pls. XLIV. XLV]

The skull appears to be that of a young adult of less than 25 years of age. It is small in size, the calculated cranial capacity being 1203.30 cc. Vault sutures as well as spheno-basilar suture are not ossified. The sex is undoubtedly female ; small mastoids, poor glabella and arcus superciliaries are feminine features. The skull is notably smooth in surface relief. In *norma verticalis*, the cranial contour is *byrsoides* in shape. In *norma temporalis* the forehead rises vertically and from obelion slopes backwards in the parieto-occipital region. The occipital squama is prominent and projected behind the inion. The vault of the skull is relatively low, basion-bregma height being 119 mm only.

SKL. Pot No. 12 (b)

Adult female. The skull is small rather gracile in structure. It is incomplete. The entire facial region including maxillae and palate, part of the frontal bone and zygomatic arches are absent. The cranial surface is eroded and all the cranial sutures cannot be seen perfectly. As far as can be seen all the sutures appear to be un-united. The head shape, seen from above, is elliptical. In profile the vertex is well arched and the occiput recedes obliquely with pronounced occiput. *Norma verticalis* is house-shaped with slightly downward converging side walls.



Natural Position



Norma Lateralis

DIOPTOGRAPH TRACING (WASH) : FEMALE SKL. Pot No. 12 (a) (Natural Size)

ANALYSIS

Of the 16 crania measured 3 were adult males, 12 adult females, 1 juvenile and 1 infant. On the basis of metric and cranial observations 1 adult cranium (1 male and 2 females) have been classified as belonging to the long-headed Type A, 6 adult crania (all females) as so-called Type A₁ and 2 adult crania (1 male and 1 female) as so-called Type B.

Distribution of the adult crania according to type of sex is as follows:

SEX	TYPE A	TYPE A ₁	TYPE B
MALE	M 275 (1) M 311		M 266 (1)
FEMALE	M 216 M 1105 (1)	M 171 (1) M 212 (1) M 159 (1) M 250 (1) M 44 M 50 (1) M 211 (1) M 55 (1) M 12 (1) M 15 (1) M 12 (1)	M 217 (1)

TYPE A

In Tables 125-126, 136-137 the mean measurements and indices of the male and female Type A skulls from Cemetery H at Harappa are given in detail. The salient craniofacial features of the Type A skulls from Harappa are as follows:

	MALE	FEMALE
Length-breadth index	Endocranium (72.1)	Endocranium (71.42)
Length-height index	Endocranium (70.65)	Chondrocranium (69.84)
Breadth-height index	Metocranium (62.66)	Metocranium (60.35)
Length-auricular height index	Endocranium (62.11)	Endocranium (60.66)
Breadth-auricular height index	Metocranium (64.96)	Tapechocranium (70.64)
Transverse frontoparietal index	Frontocranium (70.17)	Frontocranium (70.62)
Superior facial index	Eye (69.66)	
Orbital index	Mezocranium (77.6) & (105)	Hypocranium (64.62)
Nasal index	Chondrocranium (75.24)	Chondrocranium (71.41)

In Plate XLVI and in Figures 104-106 are presented photographs and diophtographic drawings of Type A male cranium. In the male strong supraorbital ridges, relatively flat vertex, prominent occiput, highly depressed nose, rather short and moderately wide nasal aperture and prominent cheek bones are well represented. Viewed from the top, the skull looks like an elongated oval. In the front view, the upper face is of medium height and width.

TYPE A₂

In Tables 139 to 144 are presented the mean cranial measurements and indices of the female skulls belonging to Type A₂. Any male skull representing this type is conspicuously absent.

The essential cranio-facial features of female belonging to Type A₂ is as follows :

Length-breadth index	Mesocranic	(75.15 ± 0.70)
Length-height index	Orthocranic	(71.36 ± 1.68)
Breadth-height index	Acrocranic	(98.42 ± 2.61)
Length-auricular height index	Orthocranic	(61.00 ± 0.58)
Breadth-auricular height index	Metriocranic	(82.80 ± 2.29)
Superior facial index	Mesen	(51.36 ± 1.38)
Orbital index	Mesoconchic	(81.09 ± 1.44)
Nasal index	Chamaerrhine	(55.44 ± 2.23)
Cranial Capacity	Euencephal	(1235.76 ± 24.24)
Palatal index	Brachystaphylin	(85.37)
Transverse fronto-parietal index	Eurymetopic	(70.07 ± 2.00)

Female skulls of Type A₂ from jar burials are dolichocranic to sub-mesocranic, with an average cranial index range of 73-75. They represent a people who are relatively small-headed with a small cranial capacity, averaging 1235.76 cc for the females. In Plate XLVII and Figures 107-109 are given photographs and dioptrographic drawings of the female belonging to Type A₂ in jar burials. The sagittal contour shows that the vault of the skull is low with moderately protruding occiput. The forehead is narrow and vertical.

TYPE B₂

Only two crania (1 male and 1 female) have been classified as Type B₂. Both the skulls are damaged. Morphologically these skulls closely conform to round-headed skulls found at Cemetery H Open Burials.

DISCUSSION

From the foregoing account of the crania, it appears that a new physical type is represented in Cemetery H st I (jar burials). It is a small-brained, weakly mesocephalic people, designated by us as Type A₂. In addition, four long-headed skulls [Nos. H 255 (a), H 344, II 246 (c) and H 7435 (b)] seem to resemble, both metrically and morphologically, Type A skulls of Cemetery R 37 and two round-headed skulls [Nos. II 206 (B) and II 245 (e)] correspond more closely with the round-headed Type B₂ (open burials) than the round-headed Type B₁ (Area G).

On the otherhand, crania of Type A₁ skulls are remarkable for a sort of small size and rounded head (the skull gravitate around the middle of 75-80), low vault with small to moderate and pinched forehead, poorly developed supraorbital ridges and feeble nose. The attachments

Differences in mean measurements between Type A₁ skulls of Cemetery R 37 (post-burial) and Type A₁ females of Cemetery R 37 is clearly demonstrated in Table 117.

TABLE 117

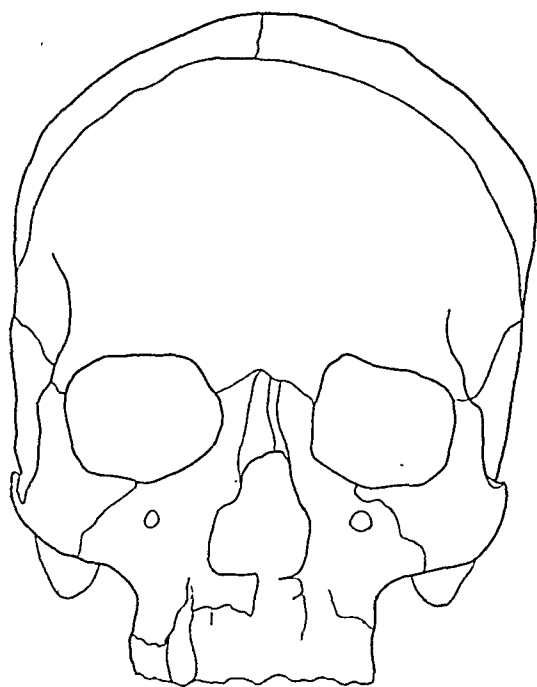
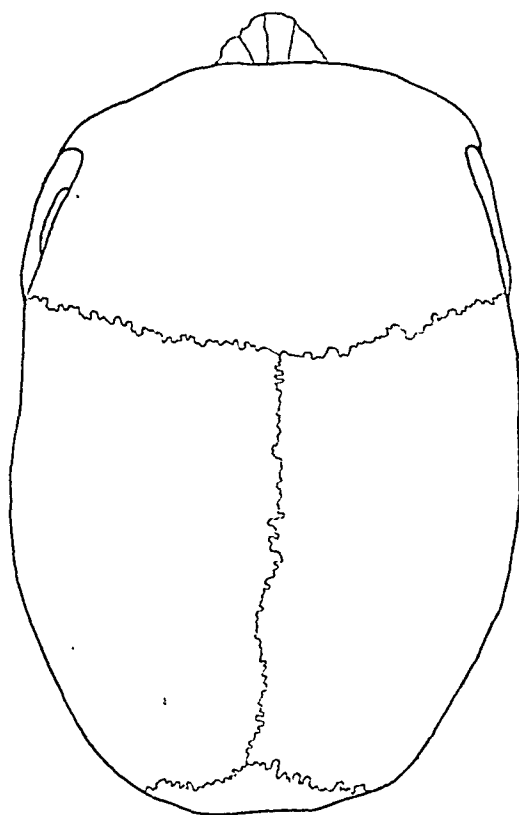
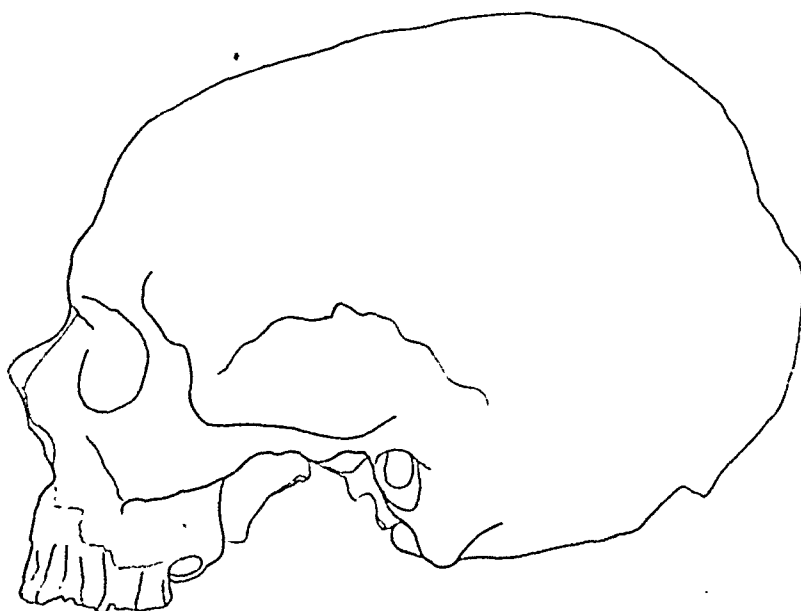
Showing deviations of Type A₁ from Type A₁ in selected cranial linear dimensions

Character	Female Type A ₁ Cemetery R 37	Female Type A ₁ Cemetery R Burial 37	Difference
Max. breadth of vault	145.0	135.0	10.0
Max. breadth of face	120.0	120.0	0.0
Vert. max. post. breadth	111.0	105.0	6.0
Post. max. breadth	110.0	95.0	15.0
Vert. max. breadth of face	100.0	95.0	5.0
Cranial height	111.0	110.0	1.0
Cranial depth	125.125	125.000	0.125
Max. post. breadth of face	100.0	95.0	5.0
Post. breadth of face	121.00	121.0	0.0
Max. breadth	100.0	95.0	5.0
Max. breadth	121.0	121.0	0.0
Post. breadth	120.0	115.0	5.0
Post. breadth	100.0	95.0	5.0

It appears from Table 117 that the Type A₁ is smaller than Type A₁ in all major dimensions. Though metrically there is no indication of close similarity between Type A₁ and Type A₁, nevertheless in general appearance the difference between Type A₁ and Type A₁ is not remarkably large. One of the important problem now emerge, whether Type A₁ may be considered as variant of Type A₁ of Cemetery R 37 or they represent a separate distinct Type A₁ skulls may be identified as a smaller form of Classic Mediterranean (to use Coon's expression) and in all probability they were not identical with earlier population of Harappan culture.

B. EXTREMITY BONES

Since most of the burial jars of Cemetery R 37 contained fractional burials, the quantity of post-cranial bones deposited in them was less in comparison to regular burials of R 37 and Cemetery R 37. The extremity bones in perfectly measureable condition were poorly represented in the jar

Fig. 104 *Norma Frontalis*Fig. 105 *Norma Verticalis*Fig. 106 *Norma Lateralis*

Figs. 104, 105 and 106. Diophtographic contours of Type A Male [Sk1. H 255 (a)] of Cemetery II St. I (Jar burials)



Norma Frontalis

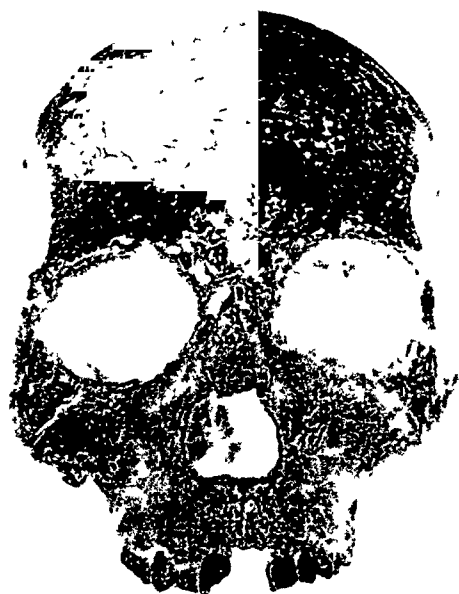


Norma Verticalis



Norma Lateralis

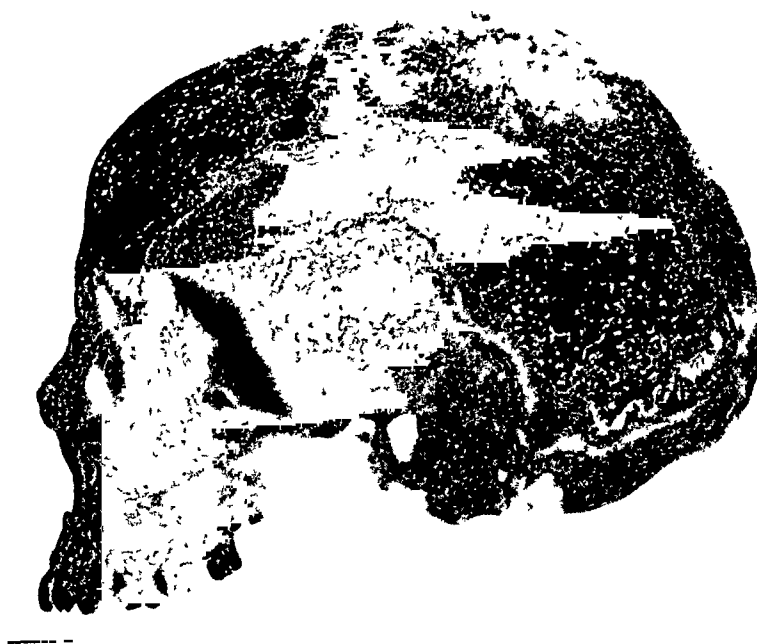
Photographs of Type A Male [SkI. H 255 (a)] of Cemetery H St. I (Jar burials)



Norma Frontalis



Norma Verticalis



Norma Lateralis

Photographs of Type A; Female [Skl. Pot No. 11] of Cemetery H St. I (Jar burials)

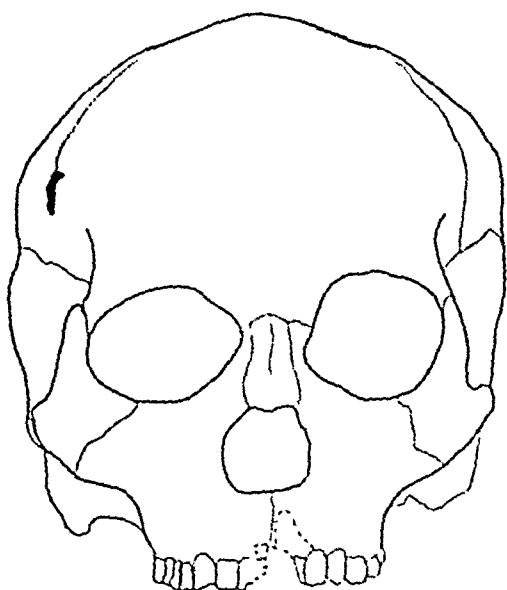


Fig. 107 Norma Frontalis

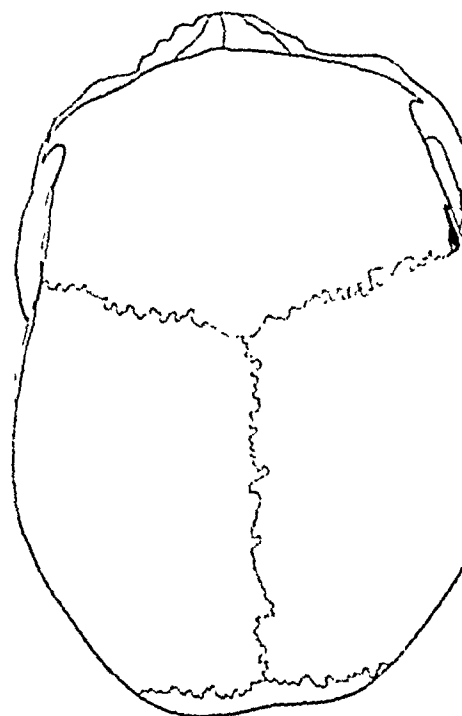


Fig. 108 Norma Verticalis

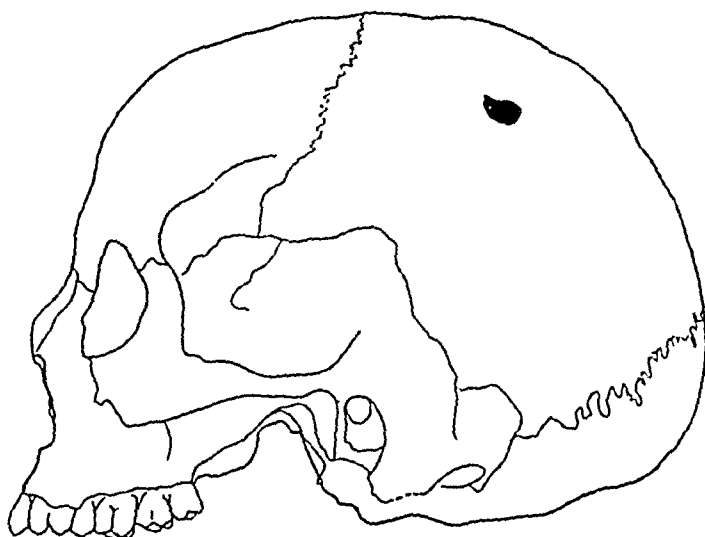


Fig. 109 Norma Lateralis

Figs. 107, 108 and 109. Dioptrigraphic contours of Type A₂ Female
[Skl. Pot No. 11] of Cemetery H St. I (Jar burials)

burials. Primary data on them have been produced in the Collective Table N, while their average values have been shown in Tables 118 and 119.

HUMERUS

Three humeri (two right and one left) of two females are measured.

TABLE 118

Humerus

Character	n	Female	
		Range	Mean
Maximum length	3	279.0-319.0	305.33
Breadth of proximal epiphysis	3	43.0- 45.0	43.83
Breadth of distal epiphysis	3	53.5-55.5	54.33
Circumference of the shaft at the middle	2	52.0- 59.0	55.50
Minimum circumference of diaphysis	3	51.0- 55.0	52.33
Robusticity index	3	15.99-18.28	17.19



Fig. 110 Skl. H 206 (d)
Female: (Rt)
Volar projection

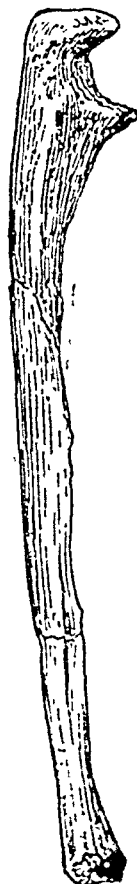


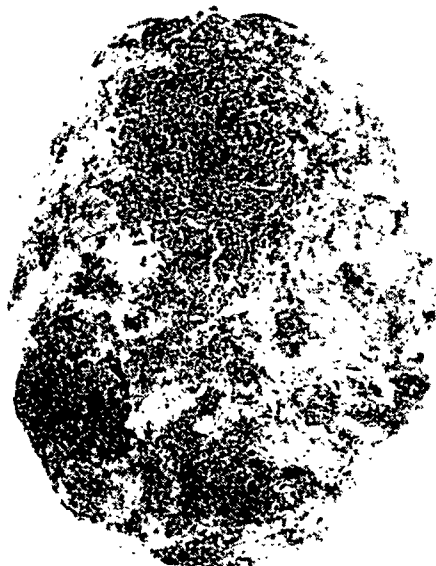
Fig. 111 Skl. H 206 (d)
Female: (Rt)
Lateral projection

In relation to open burial female humeri of st II, those of jar burials st I were longer in size. Robusticity index, however, reveals that jar burial humeri (17.19) were weaker than open burial (19.14). The range of the former varies from 15.99 to 18.28 and that of the latter between 18.46 to 20.22.

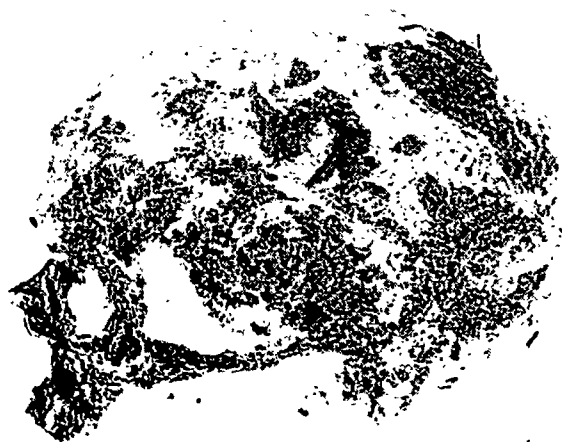
Septal aperture is found in two cases, viz., Skl. H 206 (d) and in a juvenile H 206 (a) (both being right humeri).



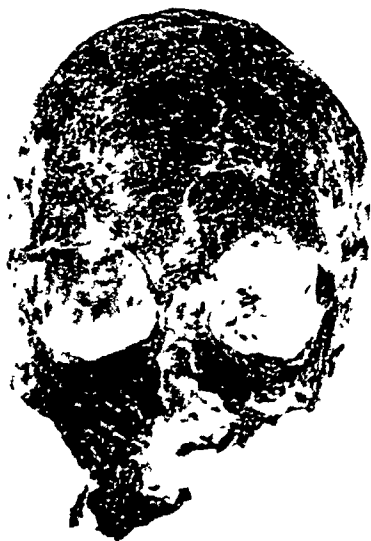
Frontal view



Vertical view



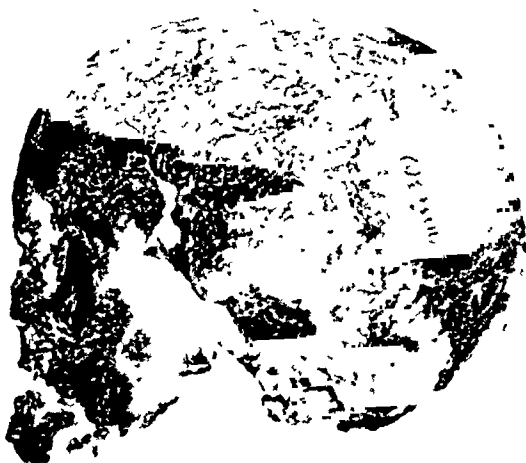
Left lateral view



Frontal view



Vertical view



Left lateral view



Occipital view

RADIUS AND ULNA

Measurements of a single radius (left) of a female individual [Skl. H 247 (a)] and one ulna of a male [Skl. H 601 (a), left] are shown in Collective Table N. Another ulna [H 206 (d), Figs. 110 & 111], without its styloid process, shows a physiological length of 223 mm and a minimum circumference of diaphysis of 32 mm.

FEMUR

Only two femora of two females [Skl. H 154 (a), H 206 (c)] are measured of which mean values are tabulated in Table 119.

TABLE 119

Femur

Character	n	Female	
		Range	Mean
Sagittal diameter at middle of diaphysis	2	25.5 - 26.00	25.75
Transversal diameter at middle of diaphysis	2	25.0 - 28.00	26.50
Circumference of the shaft at the middle	2	80.0 - 83.00	81.50
Pilastric index	2	91.07 - 104.00	97.54
Platymerie index	2	73.33 - 85.71	79.52

None of the femora yielded the measurement of maximum length. In both the bones antero-posterior diameter of the proximal shaft is slender in relation to the transverse diameter at the same point ; in platymerie index, one is platy- and the other is eurymeric. Pilastric index indicates primitiveness when compared with other modern populations (Wilder 1920 : 126).

Only one female tibia (Skl. H 61, left) has been measured whose maximum length is 365 mm and robusticity index is 20.61.

STATURE

Stature of a single male [Skl. H 601 (a)] and three females [Skl. H 61, H 206 (c) and H 206 (d)] could be estimated. The only male shows a stature of 1601.25 mm (below medium) according to Manouvrier's Table. Of the three females, two are of Type A₂ who were probably above medium in stature, the average being 1581 mm according to Dupertuis and Hadden's 'general formulae'.

STATISTICAL CONSTANT : CEMETERY H (JAR BURIALS)

TABLE 120

ADULT MALE TYPE A

Mean Measurements and Indices of the Neurocranium .

Characters	n	Mean	Min.	Max.
Max. cranial length	2	191.00	184.0?	198.0
Max. cranial breadth	2	138.00	135.0	141.0
Nasion-inion line	2	172.50	165.0	180.0
Basion-bregma height	2	135.00	134.0	136.0
Min. frontal breadth	2	96.75	95.0	98.5
Vertical porion height	2	118.50	118.0	119.0
Median sagittal arc	2	381.50	379.0	384.0
Vertical transversal arc	2	311.50	307.0	316.0
Horizontal circumference	2	533.50	522.0	545.0
Cranial module	2	154.67	153.67	155.67
Calculated cranial capacity	2	1470.89	1459.13	1482.65
Length-breadth index	2	72.40?	68.18	76.63?
Length-height index	2	70.80?	67.68	73.91?
Breadth-height index	2	97.86	96.45	99.26
Length-auricular height index	2	62.14?	59.60	64.67?
Breadth-auricular height index	2	85.90	84.40	87.41
Tr. fronto-parietal index	2	70.17	67.38	72.96

TABLE 121

ADULT MALE TYPE A

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	Min.	Max.
Prosthion-basion line	2	102.50	98.0	107.0
Nasion-prosthion line	2	65.50	60.0	71.0
Nasion-gnathion line	1	123.00	—	—
Bizygomatic breadth	2	133.50	131.0	136.0
Nasal height	2	49.00	47.0	51.0
Nasal breadth	2	27.00	27.0	27.0
Ant. inter-orbital breadth	2	22.00	22.0	22.0
Orbital breadth (right)	2	40.75	39.0	42.5
Orbital breadth (left)	2	41.75	40.0	43.5
Orbital height (right)	2	32.25	30.5	34.0
Orbital height (left)	2	31.75	30.0	33.5
Maxillo alveolar length	2	56.00	56.0	56.0
Maxillo alveolar breadth	1	63.00	—	—
Palatal length	1	47.00	—	—
Palatal breadth	1	41.00	—	—

TABLE 121 - Continued

Characters	n	Mean	Min.	Max.
Total facial index	1	93.89	—	—
Superior facial index	2	49.16	44.12	54.20
Orbital index (right)	2	79.10	78.21	80.00
Orbital index (left)	2	76.00	75.00	77.01
Nasal index	2	55.20	52.94	57.45
Maxillo-alveolar index	1	112.50	—	—

TABLE 122

ADULT MALE TYPE A

Mean Indices of the Whole Skull

Characters	n	Mean	Min.	Max.
Tr. cranio-facial index	2	96.74	96.45	97.04
Vert. cranio-facial index	2	47.45	41.91	52.99
Long. cranio-facial index	2	53.65	53.26	54.04
Jugo-frontal index	2	72.52	69.85	75.19

TABLE 123

ADULT MALE TYPE A

Mean Measurements and Indices of the Mandible

Characters	n	Mean	Min.	Max.
Bigonial breadth	2	87.25	74.50	100.00
Bicondylar breadth	1	111.00	—	—
Ht. of mandibular ramus	1	62.00	—	—
Max. breadth of mandibular ramus	1	46.00	—	—
Min. breadth of mandibular ramus	2	34.75	34.50	35.00
Ht. at mandibular symphysis	2	27.75	24.00	31.50
Mandibular length	2	84.25	80.50	88.00
Mandibular angle	2	121°	117°	125°
Mandibular index	1	79.28	—	—
Breadth index of mandible	1	90.09	—	—
Jugo-mandibular index	2	65.56	54.78	76.34

TABLE 124

ADULT MALE TYPE A

Mean Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₁	1	11.00
Labiolingual crown diam. of M ₁	1	12.00
Mesiodistal crown diam. of M ₂	1	10.50
Labiolingual crown diam. of M ₂	1	11.75
Mesiodistal crown diam. of M ₃	1	9.00
Labiolingual crown diam. of M ₃	1	11.00
Crown index of M ₁	1	113.64
Crown index of M ₂	1	112.28
Crown index of M ₃	1	122.22

TABLE 125

ADULT MALE TYPE A

Mean Measurements and Indices of the Permanent Mandibular Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₁	1	10.50
Labiolingual crown diam. of M ₁	1	11.50
Mesiodistal crown diam. of M ₂	1	11.50
Labiolingual crown diam. of M ₂	1	10.50
Crown index of M ₁	1	109.52
Crown index of M ₂	1	91.30

TABLE 126

ADULT MALE TYPE B₂

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean
Max. cranial length	1	180.0?
Max. cranial breadth	1	138.0
Vertical transversal arc	1	312.0
Horizontal circumference	1	510.0
Length-breadth index	1	76.67?

TABLE 127

ADULT MALE TYPE B₂

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean
Maxillo-alveolar length	1	50.0
Maxillo-alveolar breadth	1	62.0
Palatal length	1	42.0
Palatal breadth	1	39.0
Maxillo-alveolar index	1	124.00
Palatal index	1	92.86

TABLE 128

ADULT MALE TYPE B₂

Mean Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₁	1	10.75
Labiolingual crown diam. of M ₁	1	12.25
Mesiodistal crown diam. of M ₂	1	9.50
Labiolingual crown diam. of M ₂	1	12.50
Mesiodistal crown diam. of M ₃	1	9.50
Labiolingual crown diam. of M ₃	1	11.50
Crown index of M ₁	1	113.96
Crown index of M ₂	1	131.58
Crown index of M ₃	1	122.40

TABLE 129

ADULT MALE TYPE B₂

Mean Measurements and Indices of the Permanent Mandibular Molar Teeth

Characters	n	Mean
Mesiodistal crown diam. of M ₁	1	12.00
Labiolingual crown diam. of M ₁	1	11.25
Mesiodistal crown diam. of M ₂	1	10.75
Labiolingual crown diam. of M ₂	1	11.25
Mesiodistal crown diam. of M ₃	1	10.00
Labiolingual crown diam. of M ₃	1	10.75
Crown index of M ₁	1	93.82
Crown index of M ₂	1	101.66
Crown index of M ₃	1	107.61

TABLE 130

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S.E.	S. D.	C. V.	Min.	Max.
Max. cranial length	3	187.33	±	5.46	9.45	5.04	180.00	198.00
Max. cranial breadth	3	138.00	±	1.73	3.00	2.17	135.00	141.00
Nasion-inion length	2	172.50			—	—	165.00	180.00
Basion-bregma height	2	135.00			—	—	134.00	136.00
Min. frontal breadth	2	96.75			—	—	95.00	98.50
Vertical porion height	2	118.50			—	—	118.00	119.00
Median sagittal arc	2	381.50			—	—	379.00	384.00
Vert. transversal arc	3	311.67	±	2.61	4.51	1.45	307.00	316.00
Horizontal circumference	3	523.67	±	11.88	20.55	3.92	504.00	545.00
Cranial module	2	154.67			—	—	153.67	155.67
Calculated cranial capacity	2	1470.89			—	—	1459.13	1482.65
Length-breadth index	3	73.83	±	2.83	4.89	6.62	68.18	76.67?
Length-height index	2	70.80			—	—	67.68	73.91?
Breadth-height index	2	97.86			—	—	96.45	99.26
Length-auricular height index	2	62.14			—	—	59.60	64.67?
Breadth-auricular height index	2	85.90			—	—	84.40	87.41
Tr. fronto-parietal index	2	70.17			—	—	67.38	72.96

TABLE 131

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S.E.	S. D.	C. V.	Min.	Max.
Prosthion-basion line	2	102.50			—	—	98.00	107.00
Nasion-prosthion line	2	65.50			—	—	60.00	71.00
Nasion-gnathion line	1	123.00			—	—	—	—
Bizygomatic breadth	2	133.50			—	—	131.00	136.00
Nasal height	2	49.00			—	—	47.00	51.00
Nasal breadth	2	27.00			—	—	27.00	27.00
Ant. inter-orbital breadth	2	22.00			—	—	22.00	22.00
Orbital breadth (right)	2	40.75			—	—	39.00	42.50
Orbital breadth (left)	2	41.75			—	—	40.00	43.50
Orbital height (right)	2	32.25			—	—	30.50	34.00
Orbital height (left)	2	31.75			—	—	30.00	33.50
Maxillo-alveolar length	3	54.00	±	2.00	3.46	6.41	50.00	56.00
Maxillo-alveolar breadth	2	62.50			—	—	62.00	63.00
Palatal length	2	44.50			—	—	42.00	47.00
Palatal breadth	2	40.00			—	—	39.00	41.00

TABLE 131-Continued

Characters	n	Mean	S. D.	C. V.	Min.	Max.
Total facial index	1	93.89	—	—	—	—
Superior facial index	2	49.16	—	—	44.12	54.20
Orbital index (right)	2	79.10	—	—	78.21	80.00
Orbital index (left)	2	76.00	—	—	75.00	77.01
Nasal index	2	55.20	—	—	52.94	57.45
Maxillo-alveolar index	2	118.25	—	—	112.50	124.00
Palatal index	1	92.86	—	—	—	—

TABLE 132

ADULT MALE COMBINED

Mean Indices of the Whole Skull

Characters	n	Mean	Min.	Max.
Tr. cranio-facial index	2	96.74	96.45	97.04
Vert. cranio-facial index	2	47.45	41.91	52.99
Long. cranio-facial index	2	53.65	53.26	54.04
Jugo-frontal index	2	72.52	69.85	75.19

TABLE 133

ADULT MALE COMBINED

Statistical Constants of the Mandibular Measurements and Indices

Characters	n	Mean	± S.E.	S. D.	C. V.	Min.	Max.
Bigonial breadth	2	87.25	—	—	—	74.50	100.00
Bicondylar breadth	1	111.00	—	—	—	—	—
Ht. of mandibular ramus	1	62.00	—	—	—	—	—
Max. breadth of mandibular ramus	1	46.00	—	—	—	—	—
Min. breadth of mandibular ramus	2	34.75	—	—	—	31.50	35.00
Ht. at mandibular symphysis	3	29.33	± 2.68	4.61	15.82	21.00	32.50
Mandibular length	2	84.25	—	—	—	80.50	89.00
Mandibular angle	2	121°	—	—	—	117°	125°
Mandibular index	1	79.28	—	—	—	—	—
Breadth index of mandible	1	93.09	—	—	—	—	—
Jugo mandibular index	2	65.56	—	—	—	51.78	70.04

TABLE 134

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.88	10.75	11.00
Labiolingual crown diam. of M ₁	2	12.38	12.25	12.50
Mesiodistal crown diam. of M ₂	2	10.00	9.50	10.50
Labiolingual crown diam. of M ₂	2	12.12	11.75	12.50
Mesiodistal crown diam. of M ₃	2	9.25	9.00	9.50
Labiolingual crown diam. of M ₃	2	11.25	11.00	11.50
Crown index of M ₁	2	113.80	113.64	113.96
Crown index of M ₂	2	121.93	112.28	131.58
Crown index of M ₃	2	122.31	122.22	122.40

TABLE 135

ADULT MALE COMBINED

Statistical Constants of the Measurements and Indices of Permanent Mandibular Molar Teeth

Characters	n	Mean	Min.	Max.
Mesiodistal crown diam. of M ₁	2	11.25	10.50	12.00
Labiolingual crown diam. of M ₁	2	11.38	11.25	11.50
Mesiodistal crown diam. of M ₂	2	11.12	10.75	11.50
Labiolingual crown diam. of M ₂	2	10.88	10.50	11.25
Mesiodistal crown diam. of M ₃	1	10.00	—	—
Labiolingual crown diam. of M ₃	1	10.75	—	—
Crown index of M ₁	2	101.67	93.82	109.52
Crown index of M ₂	2	97.98	91.30	104.66
Crown index of M ₃	1	107.64	—	—

TABLE 136

ADULT FEMALE TYPE A

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	Min.	Max.
Max. cranial length	2	180.00	178.0	182.0
Max. cranial breadth	2	132.00	129.0?	135.0
Nasion-inion length	2	166.00	165.0	167.0
Basion-bregma height	2	126.00	117.0	135.0
Min. frontal breadth	2	93.50	91.0	96.0
Vertical porion height	2	105.50	100.0	111.0

TABLE 136-Continued

Characters	n	Mean	Min.	Max.
Median sagittal arc	2	360.50	350.0	371.0
Vertical transversal arc	2	290.50	283.0	298.0
Horizontal circumference	2	536.00	499.0	573.0
Cranial module	2	146.00	141.33?	150.67
Calculated cranial capacity	1	1324.35	—	—
Length-breadth index	2	73.32?	72.47?	74.18
Length-height index	2	69.96	65.73	74.18
Breadth-height index	2	95.35?	90.70?	100.00
Length-auricular height index	2	58.58	56.18	60.99
Breadth-auricular height index	2	79.87?	77.52?	82.22
Tr. fronto-parietal index	2	70.82?	70.54?	71.11

TABLE 137

ADULT FEMALE TYPE A

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	Min.	Max.
Prosthion-basion line	1	100.50?	—	—
Nasion-prosthion line	1	57.00	—	—
Nasal height	1	44.00?	—	—
Nasal breadth	1	23.50	—	—
Ant. inter-orbital breadth	2	19.25	18.5	20.0
Orbital breadth (right)	2	39.00	39.0	39.0
Orbital breadth (left)	2	40.25	39.0	41.5
Orbital height (right)	1	33.00	—	—
Orbital height (left)	1	30.00	—	—
Maxillo-alveolar length	1	57.00	—	—
Maxillo-alveolar breadth	1	64.00	—	—
Orbital index (right)	1	84.62	—	—
Orbital index (left)	1	72.29	—	—
Nasal index	1	53.41?	—	—
Maxillo-alveolar index	1	112.28	—	—

TABLE 138

ADULT FEMALE TYPE A

Mean Indices of the Whole Skull

Characters	n	Mean
Vert. cranto-facial index	1	48.72?
Long. cranto-facial index	1	56.46?

TABLE 139

ADULT FEMALE TYPE A₂

Mean Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S. E.	Min.	Max.
Max. cranial length	7	175.71	±	1.15	173.0	181.0
Max. cranial breadth	7	129.43	±	1.85	119.0	133.0
Nasion-inion length	5	166.50	±	1.80	162.0	173.0
Basion-bregma height	9	126.39	±	2.46	117.0?	139.0
Min. frontal breadth	7	91.50	±	2.31	85.0	104.0
Vertical porion height	5	108.80	±	2.27	103.0	117.0
Median sagittal arc	6	354.33	±	2.62	344.0	362.0
Vertical transversal arc	6	289.42	±	3.26	282.0	304.0
Horizontal circumference	8	492.62	±	2.40	483.0	504.0
Cranial module	5	143.97	±	1.20	141.00	147.67
Calculated cranial capacity	5	1235.76	±	24.24	1160.87	1300.50
Length-breadth index	5	75.15	±	0.70	72.73	76.88
Length-height index	7	71.36	±	1.68	64.64?	78.98
Breadth-height index	7	98.42	±	2.61	90.84	108.59
Length-auricular height index	4	61.00	±	0.58	59.54	62.14
Breadth-auricular height index	4	82.80	±	2.29	78.63	89.31
Tr. fronto-parietal index	6	70.07	±	2.00	65.79	79.39

TABLE 140

ADULT FEMALE TYPE A₂

Mean Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S.E.	Min.	Max.
Prosthion-basion line	5	92.40	±	2.64	85.0	100.0
Nasion-prosthion line	5	59.80	±	2.06	54.0	65.0
Nasion-gnathion line	1	96.00?			—	—
Bizygomatic breadth	4	121.50	±	2.40	116.0	126.0
Nasal height	7	46.50	±	1.72	40.0	54.0
Nasal breadth	6	25.00	±	0.86	22.0	28.0
Ant. inter-orbital breadth	7	18.43	±	0.92	15.0	22.0
Orbital breadth (right)	6	39.42	±	1.02	35.0	42.0
Orbital breadth (left)	5	38.40	±	1.32	34.0	41.5
Orbital height (right)	6	32.67	±	0.73	30.0	35.0
Orbital height (left)	4	31.88	±	0.83	30.0	34.0
Maxillo-alveolar length	3	55.00	±	3.22	49.0	60.0?
Maxillo-alveolar breadth	3	64.00	±	0.29	63.5?	64.5

TABLE 140 - Continued

Characters	n	Mean \pm S.E.	Min.	Max.
Palatal length	4	41.50 \pm 1.04	39.0	44.0
Palatal breadth	1	35.00?	48.71	—
Superior facial index	3	51.36 \pm 1.38	75.00	53.36
Orbital index (right)	5	79.91 \pm 1.37	75.90	83.33
Orbital index (left)	4	82.56 \pm 2.82	48.48	88.24
Nasal index	6	55.44 \pm 2.23	105.83?	65.12
Maxillo-alveolar index	3	117.21 \pm 7.23	—	130.61
Palatal index	1	85.37?	—	—

TABLE 141

ADULT FEMALE TYPE A₂

Mean Indices of the Whole Skull

Characters	n	Mean \pm S. E.	Min.	Max.
Tr. cranio-facial index	2	91.98	88.55	95.42
Vert. cranio-facial index	5	48.12 \pm 1.61	43.20	53.28
Long. cranio-facial index	5	52.90 \pm 1.28	49.13	56.82
Jugo-frontal index	3	73.94 \pm 2.02	70.63	77.59

TABLE 142

ADULT FEMALE TYPE A₂

Mean Measurements and Indices of the Mandible

Characters	n	Mean	Min.	Max.
Ht. of mandibular ramus	2	53.75	50.5	57.0
Max. breadth of mandibular ramus	2	40.25	39.0	41.5
Min. breadth of mandibular ramus	2	32.00	30.0	34.0
Ht. at mandibular symphysis	1	21.00	—	—
Mandibular length	2	81.50	81.0	83.0
Mandibular angle	2	123	123	123

TABLE 143

ADULT FEMALE TYPE A₂

Mean Measurements and Indices of the Permanent Maxillary Molar Teeth

Characters	n	Mean	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.88	10.75	11.00
Labiolingual crown diam. of M ₁	2	11.62	11.25	12.00
Mesiodistal crown diam. of M ₂	2	9.75	9.50	10.00
Labiolingual crown diam. of M ₂	2	11.00	11.00	11.00
Mesiodistal crown diam. of M ₃	1	9.00	—	—
Labiolingual crown diam. of M ₃	1	10.00	—	—
Crown index of M ₁	2	106.92	104.76	109.09
Crown index of M ₂	2	112.90	110.00	115.79
Crown index of M ₃	1	111.11	—	—

TABLE 144

ADULT FEMALE TYPE A₂

Mean Measurements and Indices of the Permanent Mandibular Molar Teeth

Characters	n	Mean	±	S. E.	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.38			10.00	10.75
Labiolingual crown diam. of M ₁	2	10.38			9.75	11.00
Mesiodistal crown diam. of M ₂	3	9.83	±	0.60	9.00	11.00
Labiolingual crown diam. of M ₂	3	10.00	±	1.04	8.50	12.00
Mesiodistal crown diam. of M ₃	3	9.33	±	0.16	9.00	9.50
Labiolingual crown diam. of M ₃	3	9.83	±	0.60	9.00	11.00
Crown index of M ₁	2	100.40			90.80	110.00
Crown index of M ₂	3	101.46	±	5.97	89.72	109.09
Crown index of M ₃	3	105.65	±	8.43	94.74	122.22

TABLE 145

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Neurocranium

Characters	n	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Max. cranial length	10	176.50	±	1.03	3.24	1.84	173.00	182.00
Max. cranial breadth	10	131.70	±	2.19	6.93	5.26	119.00	147.00
Nasion-inion length	7	166.36	±	1.26	3.35	2.01	162.00	173.00
Basion-bregma height	11	126.32	±	2.33	7.73	6.12	117.00	139.00
Min. frontal breadth	9	91.94	±	1.84	5.53	6.01	85.00	104.00

TABLE 145-Continued

Characters	n	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Vertical porion height	7	107.86	±	2.06	5.47	5.07	100.00	117.00
Median sagittal arc	8	355.88	±	2.94	8.31	2.34	344.00	371.00
Vert. transversal arc	8	289.69	±	2.78	7.86	2.71	282.00	304.00
Horizontal circumference	10	501.30	±	8.22	25.97	5.18	483.00	573.00
Cranial module	7	145.05	±	1.31	3.48	2.40	141.00	150.67
Calculated cranial capacity	7	1235.45	±	25.72	68.15	5.52	1145.03	1324.35
Length-breadth index	8	75.80	±	1.29	3.64	4.80	72.47?	84.00
Length-height index	9	77.05	±	1.48	4.43	5.75	64.64?	78.98
Breadth-height index	9	97.74	±	2.19	6.57	6.72	90.70?	108.59
Length-auricular height index	6	60.20	±	0.88	2.16	3.59	56.18	62.14
Breadth-auricular height index	6	81.82	±	1.69	4.13	5.05	77.52?	89.31
Tr. fronto-parietal index	8	70.26	±	1.47	4.17	5.94	65.79	79.39

TABLE 146

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Splanchnocranium

Characters	n	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Prosthion-basion line	6	93.75	±	2.54	6.23	6.65	85.00	100.50
Nasion-prosthion line	6	59.33	±	1.75	4.29	7.23	54.00	65.00
Nasion-gnathion line	1	96.00?			—	—	—	—
Bizygomatic breadth	4	121.50	±	2.40	4.80	3.95	116.00	126.00
Nasal height	8	46.19	±	1.52	4.31	9.33	40.00?	51.00
Nasal breadth	8	24.88	±	2.08	5.90	23.71	22.00	28.00
Ant. inter-orbital breadth	9	18.61	±	0.73	2.18	11.71	15.00	22.00
Orbital breadth (right)	8	39.31	±	0.75	2.12	5.39	35.00	42.00
Orbital breadth (left)	7	38.93	±	1.01	2.67	6.86	34.00	41.50
Orbital height (right)	7	32.71	±	0.62	1.63	4.98	30.00	35.00
Orbital height (left)	5	31.50	±	0.74	1.66	5.27	30.00	31.00
Maxillo-alveolar length	4	55.50	±	2.33	4.66	8.40	49.00	60.00?
Maxillo-alveolar breadth	4	64.00	±	0.20	0.41	0.64	63.50?	64.50
Palatal length	4	41.50	±	1.04	2.98	5.01	39.00	44.00
Palatal breadth	1	35.00			—	—	—	—
Superior facial index	3	51.36	±	1.38	2.39	4.65	48.71	54.34
Orbital index (right)	6	60.70	±	1.37	3.35	4.15	75.00	81.62
Orbital index (left)	5	60.50	±	3.60	6.71	8.34	72.20	68.24
Nasal index	7	55.15	±	1.91	5.05	9.16	53.34	65.42
Maxillo-alveolar index	4	115.93	±	5.26	10.51	9.06	105.83?	140.61
Palatal index	1	85.37			—	—	—	—

TABLE 147

ADULT FEMALE COMBINED

Statistical Constants of the Mean Indices of the Whole Skull

Characters	n	Mean	\pm	S. E.	S. D.	C. V.	Min.	Max.
Tr. cranio-facial index	2	91.98			—	—	88.55	95.42
Vert. cranio-facial index	6	48.22	\pm	1.32	3.23	6.70	43.20	53.28
Long. cranio-facial index	6	53.49	\pm	1.33	3.27	6.11	49.13	56.82
Jugo-frontal index	3	73.94	\pm	2.02	3.49	4.72	70.68	77.59

TABLE 148

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the Mandible

Characters	n	Mean	\pm	S. E.	S. D.	C. V.	Min.	Max.
Bigonial breadth	1	86.00			—	—	—	—
Ht. of mandibular ramus	3	51.50	\pm	2.93	5.07	9.84	47.00	57.00
Max. breadth of mandibular ramus	3	39.50	\pm	1.04	1.80	4.56	38.00	41.05
Min. breadth of mandibular ramus	4	32.00	\pm	1.16	2.31	7.22	30.00	34.00
Ht. at mandibular symphysis	3	23.33	\pm	1.20	2.08	8.92	21.00	25.00
Mandibular length	3	81.83	\pm	3.35	5.79	7.08	76.05	88.00
Mandibular angle	3	126.33	\pm	3.34	5.77	4.57	123	133

TABLE 149

ADULT FEMALE COMBINED

Mean Measurements and Indices of Permanent Maxillary Molar Teeth

Characters	n	Mean	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.88	10.75	11.00
Labiolingual crown diam. of M ₁	2	11.62	11.25	12.00
Mesiodistal crown diam. of M ₂	2	9.75	9.50	10.00
Labiolingual crown diam. of M ₂	2	11.00	11.00	11.00
Mesiodistal crown diam. of M ₃	1	9.00	—	—
Labiolingual crown diam. of M ₃	1	10.00	—	—
Crown index of M ₁	2	106.92	104.76	109.09
Crown index of M ₂	2	112.90	110.00	115.79
Crown index of M ₃	1	111.11	—	—

TABLE 150

ADULT FEMALE COMBINED

Statistical Constants of the Measurements and Indices of the
Permanent Mandibular Molar Teeth

Characters	n*	Mean	±	S. E.	S. D.	C. V.	Min.	Max.
Mesiodistal crown diam. of M ₁	2	10.38			—	—	10.00	10.75
Labiolingual crown diam. of M ₁	2	10.38			—	—	9.75	11.00
Mesiodistal crown diam. of M ₂	3	9.83	± 0.60		1.04	10.58	9.00	11.00
Labiolingual crown diam. of M ₂	3	10.00	± 1.04		1.80	18.00	8.50	12.00
Mesiodistal crown diam. of M ₃	3	9.33	± 0.16		0.28	3.00	9.00	9.50
Labiolingual crown diam. of M ₃	3	9.83	± 0.60		1.04	10.58	9.00	11.00
Crown index of M ₁	2	100.40			—	—	90.80	110.00
Crown index of M ₂	3	101.46	± 5.97		10.32	10.17	89.72	109.09
Crown index of M ₃	3	105.65	± 8.43		14.59	13.81	94.74	122.22

* Although n denotes number of skulls (in case of tooth)

In sum, the population of mature Harappan culture (Cemetery R 37) was long-headed of which one type was tall, rugged and sturdy-built, having pronounced eye-brow ridges, receding forehead, broad nose with depressed root (Type A) ; and the other was gracile, comparatively shorter, finer and weaker (Type A₁).

In a narrow trench at Area G some round-headed crania (Type B₁) were found huddled together with the long-headed gracile type (Type A₁).

At Cemetery H Stratum II, skeletons similar to mature Harappan culture (Cemetery R 37) were discovered (Type A and Type A₁) in addition to a rather tall, large- and round-headed type (Type B₂). In Stratum I, besides the long-headed and round-headed peoples (Type A, Type A₁ and Type B₂), another rather medium statured small- and medium-headed, low-faced people (Type A₂; females only) was found.

GENERAL OBSERVATIONS

We have so long described the skulls according to the traditional way of breaking up samples into morphological types. We must, however, remember that the majority of the samples come from a population living within a restricted area of a large and populous city (ante, page 10) where some intra-breeding was presumably involved. Under these circumstances the types as based upon a combination of characters should not be taken to be identical with "races" in the modern sense of that term. Obviously, in any sample of skulls, dimensions, indices and observations will vary to some extent. Variation will be greater, the larger the sample. We have, therefore, also treated the material in the present section in a way that takes into account this variability, by calculating mean, standard deviation and standard error of the characters of samples from different strata of Harappa. It is likely that some interesting results hitherto unnoticed may become noticeable in this way.

The mean values of stature, head length, head breadth, head height, length-breadth index, length-auricular height index, superior facial height, facial breadth, superior facial index, nasal height, nasal breadth, nasal index, cranial module and cranial capacity for the male skeletons have been given in Table 151.

It is observed that the estimated statures as calculated from long bones coming from different burial sites indicate that the people of R 37 were somewhat taller than those of H.

Skulls from R 37 are distinguishable from those of H by the comparatively smaller cranial capacity of the former. The circumferences of both are however not very different. That would indicate that there is some difference in height.

TABLE 151

AVERAGE VALUES OF MEASUREMENTS AND INDICES OF MALE CRANIA FROM CEMETERY R 37 AND CEMETERY H

	HEAD LENGTH	HEAD BREADTH	HEAD HEIGHT	HOR. CIRCUM	CRANIAL CAPACITY IN CC.	L-B INDEX	L-AH INDEX	B-AH INDEX	UPPER FACE HEIGHT	BIZYG- MATIC BREADTH	SUPERIOR FACE INDEX	NASAL HEIGHT	NASAL BREADTH	NASAL INDEX	STATURE
Cemetery H															
Gr I	107.14 ± 5.05	130.00 ± 1.73	118.70	524.67 ± 11.08	1470.89	73.83 ± 2.89	62.11	85.80	65.50	133.50	49.16	49.00	27.00	55.20	—
Gr. H	189.10 ± 1.58	144.67 ± 1.23	119.00	530.33 ± 8.22	1505.19 ± 18.77	76.72 ± 1.29	61.85	85.61	70.30 ± 1.56	136.00	50.00	52.67 ± 1.10	25.50 ± 1.03	47.61 ± 1.30	1717.60 ± 13.10
Cemetery R 37	137.54 ± 1.09	139.32 ± 0.83	115.00 ± 0.81	520.00 ± 2.09	1487.57 ± 11.53	71.05 ± 0.65	61.37 ± 0.68	86.26 ± 0.71	70.62 ± 1.20	131.25 ± 2.64	52.66 ± 1.98	51.96 ± 0.90	26.08 ± 0.74	51.08 ± 1.42	1757.10 ± 23.00

Moreover, certain other distinctions are also noticeable. While the absolute lengths of the skulls of R 37 are not very different from those of H, the head is distinctly narrower, height is less, and the upper face is slightly narrower. The cranial index of R 37 is lower (71.05) than in the case of H (76.72; 73.83). This implies that people of R 37 were more long-headed and had narrower faces than those represented in Cemetery H.

We shall now consider the skulls found in only Cemetery H. If we discard the female skulls and limit ourselves only to the male skulls a slight difference is noticeable between Stratum I and II. For example, skulls from Stratum I are smaller in size and have higher nasal index than those of Stratum II. But what is significant is that a few round-headed skulls are present in both the strata, while this element is so far completely absent from Cemetery R 37. From this point of view the population of R 37 appears to be more homogenous than those represented in Cemetery H.

One of the major questions which arises from the above observations is this: Were the people of R 37 and of H genetically related to one another or not? Did the people of H replace the earlier population of R 37, or do they represent a somewhat differentiated group which lived socially separated from the rest and thus probably maintained their difference till later times? As far as the present evidence goes, it is not possible to answer either of the two questions satisfactorily. There is no positive evidence to suggest that the population of R 37 was subjected to heavy intermixture which might have brought about drastic changes in their cranial characteristics. This is in spite of the fact that between R 37 and H a very sharp change is noticeable in regard to culture.

Harappan culture was fairly widespread in north and north-western India. If samples were available from all the discovered sites it would have given us some clue about the regional differences of the population in that quarter of India in the past; but the available skulls are mainly from Rupar, Harappa, Mohenjo-daro and Lothal. It is interesting that the Harappan population of Mohenjo-daro has similarities with present-day long-headed population of Sind, so far as the cephalic index is concerned. The same relationship holds between the ancient population of Harappa and the present-day population of the Punjab. The skulls from Lothal (Sarkar, unpublished) are on the average round-headed (79.68; value calculated by us on seven better preserved skulls). This is remarkably close to the cephalic index of the present-day inhabitants of Gujarat.*

When we consider these facts it appears striking that the differentiation in regard to cephalic index observable in the Harappan age is so remarkably similar to the differentiation in the present-day population in the corresponding areas. In other words, the implication is that the population in this widespread region of India has remained more or less stable since Harappan times to the present day.

* The occurrence of round-head people at Lothal in the Harappan age cuts seriously across Risley's hypothesis that the round-headedness of Gujarat or Maharashtra was due to the Scythian invasion of India during the 1st and 2nd Century A.D.

This may or may not be borne out by fresh discoveries, or if other physical characters are taken into account ; but the above significant similarity in cephalic index cannot be overlooked in any case.

Such stability is perhaps comparable only to what is observed in connection with the population of Egypt which seems to have persisted over four or five millenia or more in the same manner as in the case of Harappa. In other parts of the world, marked changes of culture have sometimes been the result of invasion by people bearing other physical characteristics, so that cultural change has been accompanied by changes in physical characters also. But in the case of Harappa, although cultural change is marked, yet, it does not seem to have been the result of large-scale invasion ; the physical types remaining, more or less, constant. We can, therefore, suggest that even if there were invasion, the number of invaders must have been too small to bring about marked changes in physical characters, or that most of the changes were due to cultural forces of internal origin.

Acknowledgments: We wish to acknowledge our indebtedness to Dr D. K. Sen, Head of the Department of Anthropology, University of Lucknow for many profitable discussions and to Dr S. S. Sarkar, F.N.I., of the Department of Anthropology, University of Calcutta for advice and for allowing us to utilize his unpublished data on Lothal skeletons.

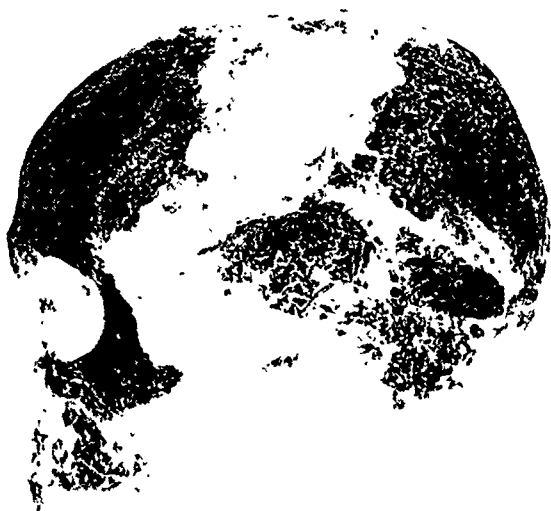
Thanks are due to Mrs Anima Roy, Mr A. Pal and Miss Bela Sinha for their co-operation in the laboratory ; to Dr G. S. Mody for helping us in determination of age of the skeletons and in preparing the list of skeletal materials, and to Mr H. Mukherjee for his assistance. Finally, we also express our thanks to Mr A. K. Chakrabarti, In-charge of Publication, Anthropological Survey of India, for his keen interest in bringing out the present volume expeditiously.



Frontal view



Vertical view



Left lateral view



Occipital view



Fig. 1 *Occlusal aspect*

Skl. H 698



Fig. 2 *Left lateral aspect*



Fig. 3 *Occlusal aspect*

Skl. H 88



Fig. 4 *Left lateral aspect*



Fig. 1 Flexor aspect of Humerus [H 502(G)]
a, right; b, left



Fig. 2 Extensor aspect of Humerus [H 502(G)]
a, right; b, left



Fig. 3 Flexor aspect of Humerus (H 710)
a, right; b, left

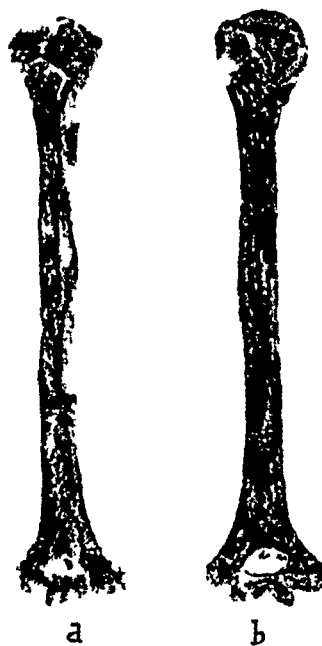
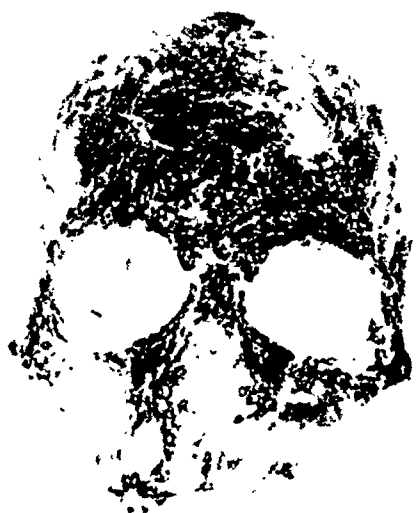


Fig. 4 Extensor aspect of Humerus (H 710)
a, right; b, left



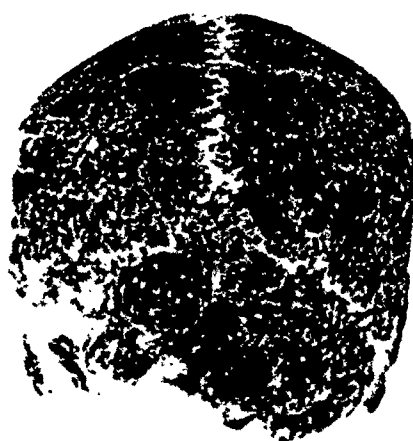
Frontal view



Vertical view



Right lateral view



Occipital view



Fig. 1 Occlusal aspect

Skl. H
255(a)



Fig. 2 Left lateral aspect



Fig. 3 Occlusal aspect

Skl. H 206 (d)

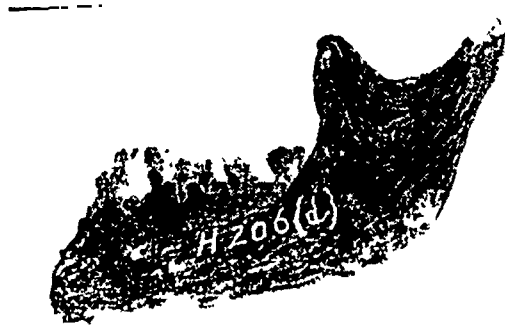


Fig. 4 Left lateral aspect



Fig. 1 Infant in embryonic position
Jar burials



Fig. 2 Occipital view showing cranial injury
(SkI H 698) : Open burials



Fig. 3 Endocranial cast of "SkI H 5151(D)" : Jar 1 AB

HUMAN REMAINS FROM HARAPPA
GUPTA, DUTTA & BASU



Fig. 1 Flexor aspect of Humerus [Skl. H 206 (d)]
(Right) : Jar burials



Fig. 2 Radial aspect of Ulna [Skl. H 206 (d)]
: Jar burials a, left; b, right

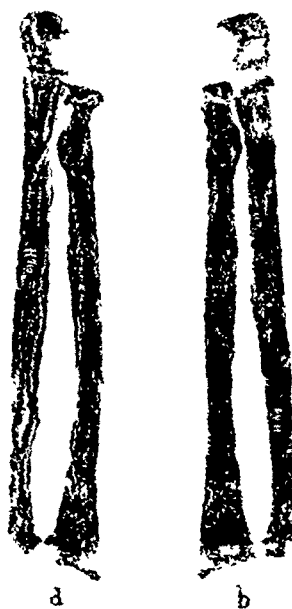


Fig. 3 Volar aspect of articulated
Radius & Ulna (Skl. H 710) : Open burials
a, left; b, right



Fig. 4 Volar aspect of articulated
Radius & Ulna (Skl. H 698) : Open burials
a, left; b, right



Fig. 1 Flexor aspect of Humerus : R 37
a, SKL 10 (rt.); b H 796 (B) (rt.); c, H 818 (lt.)

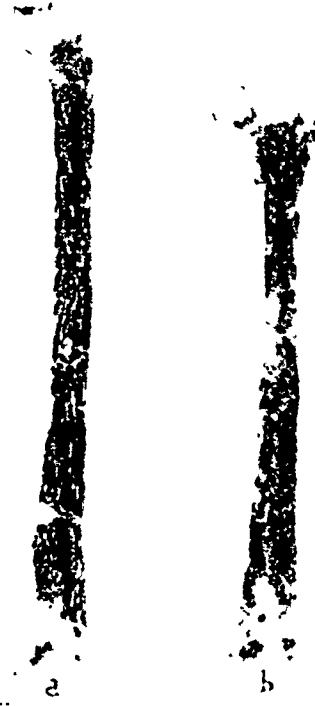


Fig. 2 Anterior aspect of Humer : Open burials
a, H 698 (left); b, H 710 (left)



Fig. 3 Anterior view of Tibia : Open burials
a, H 710; b, H 711



Fig. 4 Anterior view of Tibia & Fibula in articulation : (a) H 710; (b) H 711



Fig. 1 Hand (H 184 k)

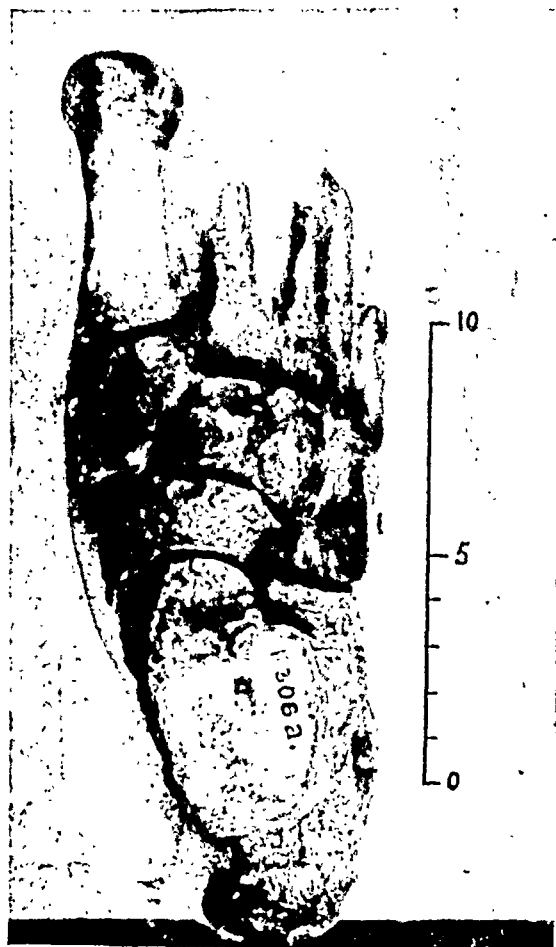


Fig. 2 Foot (306 (a))

REFERENCES

- Boyd, J. D. and J. C. Trevor 1953 .. Race, Sex, Age and Stature from Skeletal Material. In: *Modern Trends in Forensic Medicine*, edited by Keith Simpson, pp. 133-152. London, Butterworth.
- Buxton, L. H. Dudley and
D. Talbot Rice 1931 .. Report on the Human Remains found at Kish J. Roy. Anth. Inst., Vol. LXI, pp. 57-119.
- Coon, Carleton S. 1939 .. *The Races of Europe*. New York, Macmillan
- Dixon, Roland B. 1923 .. *Racial History of Man*. New York, Charles Scribner's.
- Dupertuis, C. Wesley
and John A. Hadden, Jr. 1951 .. On the Reconstruction of Stature from Long Bones. *Amer. J. Phys. Anthrop.*, N. S. Vol. 9, pp. 15-54.
- Dwight, Thomas 1891 .. Methods of estimating the height from parts of the skeleton. *Med. Rec.*, N. Y., Vol. 65, p. 16
- Frederichs, Heinz F.
and Heinrich W. Muller 1933 .. Die Rassenelemente im Indus. *Anthropos*, Band XXVIII, pp. 383-406.
- Guha, B. S. and P. C. Basu 1938 .. Report on the Human Remains Excavated at Mohenjo-daro in 1928-29. In: *Further Excavations at Mohenjo-daro*, by E. H. Mackay, Vol. I, pp. 613-638. Delhi, Govt. of India Press.
- Haddon, A. C. 1919 .. *The Wanderings of Peoples*. First ed., 1911, Reprinted (with corrections) 1912, 1919 Cambridge, Univ. Press.
- Hargreaves, H. 1935 .. *Excavations in Baluchistan*. Mem. Arch. Surv. of India, No. 35. Delhi, Govt. of India Press.
- Hooton, Earnest Albert 1946 .. *Up from the Ape*. New York, Macmillan.
- Kappers, C. U. Ariëns 1931 .. *An Introduction to the Anthropology of the Near East in Ancient and Recent Times*, with a chapter on Near Eastern Blood groups by Leland W. Parr. Amsterdam, N. V. Noord-Hollandsche Uitgeversmaatschappij.
- Keith, Sir Arthur 1931 .. Review of 'Mohenjo-daro and the Indus Civilization'. *Illustr. London News*, Dec. 19, p. 1002.

- Krogman, Wilton Marion 1937 .. Cranial types from Allsar Hüyük and their relations to other racial types, ancient and modern, of Europe and Western Asia. In: *The Allisar Hüyük, seasons of 1930-32*, by Hans Henning von der Osten, Pt. III, (*OIP* XXX), pp. 213-293. Chicago, Chicago Univ. Press.
- 1940 .. Racial types from Tepe Hissar, Iran, from the Late Fifth to the Early Second Millennium, B.C. *Kon. Ned. Akad. Wet., Verh. (Tweede Sectie)*, Dl. XXXIX, No. 2, pp. 1-87, Amsterdam.
- 1946 .. *Proc. Inst. Med. Chicago*, Vol. 16, p. 154
- Lee, Alice and Karl Pearson 1901 .. A first study of the Correlation of the Human Skull. *Phil. Trans. Roy. Soc. London, Series A*, Vol. cxcvi, pp. 225-264.
- Manouvrier, L. 1893 .. La détermination de la taille après les grandes os des membres. *Mem. de la Soc. d'Anthropol. de Paris*, 2 sér, Tome 4, pp. 347-402.
- Martin, Rudolf 1928 .. *Lehrbuch der Anthropologie*. Jena, Gustav Fischer Verlag.
- Martin, Rudolf and Karl Saller 1956 .. *Lehrbuch der Anthropologie*. 3. Aufl. Stuttgart, Gustav Fischer Verlag.
- Mollison, Theodor 1938 .. Spezielle Methoden anthropologischer Messung. In: *Handbuch der biologischen Arbeitsmethoden*, edited by Emil Abderhalden, Abt. VII, Lfg. 468, pp. 523-682. Berlin & Wien, Urban & Schwarzenberg.
- Mukherjee, Ramkrishna,
C. Radhakrishna Rao and
J. C. Trevor 1955 .. *The Ancient Inhabitants of Jebel Moya (Sudan)*. Cambridge, Univ. Press.
- Pearson, Karl 1898 .. Mathematical Contributions to the Theory of Evolution, V : On the Reconstruction of the Stature of Prehistoric Races. *Phil. Trans. Roy. Soc. London, Series A*, Vol. cxcii, pp. 169-211.
- Sergi, G. 1899 .. *Specie e varietà umane*. *Riv. di Sci. Biol.* I, Part I, p. 20.
- Sewell, Col. R. B. Seymour
and B. S. Guha 1931 .. Human Remains. In: *Mohenjo-daro and Indus Civilization*, edited by Sir John Marshall, pp. 599-616. London, Arthur Probsthan.
- Vats, Madho Sarup 1940 .. *Excavations at Harappa*, Vol. I. Delhi, Govt. of India Press, Calcutta.
- Wheeler, R. E. M. 1947 .. Harappa 1946: The Ditch and Cemetery R 37. *Ancient India*, No. 3, pp. 59-130.
- Wider, Harrie H. 1925 .. *A Laboratory Manual of Anthropometry*. Published by Blackston

- sphenoid fragments and portion of right maxilla with all the teeth of right side excepting M3; few cervical vertebrae, fragment of a thoracic vertebrae; spine piece of left scapula; lateral two-thirds of left clavicle; shaft fragments of right and left humerus; shaft of left ulna; distal three-fourth of right radius, shaft of left radius; fragments of pelvis; shaft fragments of left and right femora; shaft fragments of left and right tibiae; shaft fragments of left and right fibulae.
- 26 Skl. H 795. Adult; sex (?). Medial two-third of left clavicle; shaft of right radius; shaft fragments of right tibia and fibula fragments.
- 27 Skl. H 795/A. Adult, about 21-25 years; female. Skull not well preserved, mandible broken and had to be restored; rib fragments; right scapula; shaft fragments of left and right humerus; proximal and distal three-fourth of right ulna; distal end of right radius; phalange 4; broken shaft parts of right and left femur; right and left tibia fragments; distal end of right fibula.
- 28 Skl. H 795 A 2. Adult (?); female. Shaft and crumbled condyle of femur.
- 29 Skl. H 796. Adult; female. Typical vertebrae 2, disintegrated left hip-bone, shaft fragments of femora, shaft of left tibia.
- 30 Skl. H 796 A. Adult, above 25 years; male. Lumbar vertebrae 4, right scapula; left clavicle; proximal three-fourth of right ulna; shaft fragments of left ulna; shaft fragments of right and left radius; fragments of pelvis; proximal piece of femur; shaft of right fibula.
- 31 Skl. H 796 (B). Adult; male. Skull and mandible in locked-jaw condition; cervical vertebrae 3, thoracic vertebra 1st; rib fragments; fragments of scapulae; right clavicle; right humerus; right 3rd metacarpal.
- 32 Skl. H 797. Above 18 years; female. Left femur fragments.
- 33 Skl. H 798 (i). Adult; male. Represented by few skull pieces; right half of the mandible; right ulna shaft; right metacarpal 3; proximal phalange (hand) 4; broken parts of right and left innominate; fragments of left femur; right femur head in acetabulum; left tibia; fibula fragments.
- 34 Skl. H 798 (ii). Adult; female. Represented by skull fragments; broken mandible; 7th cervical vertebra, all thoracic and one lumbar; right clavicle; rib fragments; right humerus; right ulna fragments; right and left radius fragments; metacarpal left third; phalange (hand) intermediate 4 and distal 1; broken left femur; shaft of right tibia; proximal half of left tibia; shaft fragments of left fibula.
- 35 Skl. H 798 (iii). Adult; sex (?). Thoracic vertebra 1; lumbar vertebra 1; broken sacrum; shaft fragment of left shaft pieces of humerus; right ulna broken; proximal half of left tibia; right 3rd metatarsal; fragments of right femur shaft.
- 36 Skl. H 798 (a). Adult, about 30 to 40 years; probably female. Skull complete; fragments of left pelvis; right and left talus.
- 37 Skl. H 798 (A). Adult; male. Skull complete; rib fragments; cervical vertebrae 1st to 7th; thoracic vertebrae 1st to 10th and 12th; lumbar vertebrae 1st-3rd and 5th; ribs right 1st and 2nd; body of the sacrum; distal three-fourth of the left humerus; right hip-bone having fused crest epiphysis and ischial apophysis; complete left hip-bone; right femur shaft fragments and left chips; shaft of left tibia.
- 38 Skl. H 798/A1. Adult, about 30 years; female. Skull complete.
- 39 Skl. H 798/A2. Juvenile; female. Skull complete.
- 40 Skl. H 798/A3. About 21 years; probably male. Mandible broken in two halves; fourteen intact mandibular teeth, M₃ did not cut.
- 41 Skl. H 798 (B). Adult, between 25 and 30 years; male. Skull incomplete; greater portion of the facial region and basis cranii missing; rib fragments 2; phalanx 1.
- 42 Skl. H 798 (C). Adult, between 25 and 30 years; male. Skull incomplete.
- 43 Skl. H 798 d. Adult, above 65 years; male. Skull incomplete and defective.
- 44 Skl. H 798 e. Adult, below 30 years; female. Skull represented by frontal bone only.
- 45 Skl. H 798 f. Adult, 25-30 years; probably male. Skull represented by few pieces.
- 46 Skl. H 798 G. Adult; male. Skull represented by frontal bone mixed up with lump of earth, superciliary arches well developed.
- 47 Skl. H 799. Adult, above 25 years; sex (?). Few fragmentary pieces of thoracic and lumbar vertebrae; right scapula in pieces; right humerus fragments; broken part of ulna; olecranon piece of ulna attached with trochlear surface in hyperextension; fragments of radius; shaft of left tibia; distal three-fourth of right fibula; shaft of left fibula; right talus; phalanges.
- 48 Skl. H 800. About 18 years; male. Medial-third of costo-clavicular ligament of clavicle raised; fragments of left ulna; proximal phalanx (hand) 1; shaft and condylar fragments of right and left femur; proximal end of right and left tibia; fragments of right fibula; broken talus; cuneiform 3rd; metatarsal 3; proximal phalange 2.
- 49 Skl. H 801. Adult, about 25 years; probably female. Vertebrae cervical 5th to 7th, thoracic 1st, 12th and typical 3, lumbar 1st to 5th; left hip-bone; femur right shaft and lateral condyle intact; broken shafts of right and left fibula.
- 50 Skl. H 801A. Adult, 30 to 35 years; female. Skull complete; mandible broken in 3 pieces; thoracic vertebrae 2; rib fragments; fragmentary pieces of right and left scapula; fragments of right and left clavicle; trochlear fragments of right humerus; distal third of left humerus; fragments of right ulna; fragments of right radius; carpal 2; metacarpal 6; phalange (hand) 6; left ilium fragments; proximal end of right femur; fragmentary left femur; right and left patella; proximal half of right tibia and proximal three-fourth of left tibia; shaft fragments of right and left fibula.
- 51 Skl. H 801A1*. Adult; sex (?). Cervical vertebrae 1st to 5th in one lump; rib fragments; shaft fragments of left humerus; shaft fragments of right and left ulna; fragmentary shaft of left radius; shaft fragment of left femur; left fibula fragments.
- 52 Skl. H 801A2. Adult; sex (?). Defective right humerus.
- 53 Skl. H 801A3. Adult; female. Incomplete right hip-bone.
- 54 Skl. H 801B. Adult; male. Skull bone represented by parietal fragments, petrous portion of left temporal and mastoid processes; distal half of right humerus; shaft of right femur; fragments of right tibia; distal piece of left fibula.
- 55 Skl. H 801B*. Adult; female. Represented by skull fragments and shaft of right femur.
- 56 Skl. H 801 b(i). Adult; sex (?). (Skeleton damaged by flood). Skull represented by parietal fragments and broken portions of maxillae with few teeth in the socket.
- 57 Skl. H 801 b(ii). Adult; female. (Severely damaged by flood). Skull represented by few parietal fragments, left temporal bone, and isolated molar tooth.
- 58 Skl. H 801 b(iii). Adult; female. Represented by small pieces of skull-bone.
- 59 Skl. H 801 b(iv). Juvenile; male. Skull incomplete, lower facial part and base broken; mandible incomplete, left ascending ramus being broken; 14 mandibular teeth, M₃ did not erupt.
- 60 Skl. H 802 (i). Adult, about 25 to 30 years; female. Skull badly warped; mandible in fragments; few vertebrae; rib fragments; fragments of right clavicle; shaft fragment of right and left humerus; hip-bone fragments broken; parts of left femur and broken shaft of right tibia.
- 61 Skl. H 802 (ii). Adult; male. Skull represented by parietal and occipital fragments and isolated tooth, broken mandible; head and coracoid process of left scapula; shaft fragments of right and left femur; shaft fragments of right tibia; distal end of right fibula and left fibula.
- 62 Skl. H 802 (iii). Adult; female. Right femur shaft; left fibula with defective head.
- 63 Skl. H 802. Adult; male. Shaft fragments of right and left tibia mixed up with animal bones.
- 64 Skl. H 802A. Adult; female. Skull fragments represented by parietals and petrous portions of right temporal bone; left femur; shafts of right and left tibia; distal portion of right fibula.

- 65 Skl. H 802 A1. Adult, sex (?). Represented by axillary border of a scapula.
- 66 Skl. H 803. About 25 years; male. Broken pieces of vertebrae; rib fragments; medial $\frac{2}{3}$ rd of right clavicle; right humerus (head broken); shaft pieces of left humerus; right and left ulna fragments; right and left radius shaft fragments; right carpal 8, metacarpal medial 4 and intermediate 2; left carpal 4, left metacarpal 4, proximal phalange 4; disintegrated right femur; shaft fragment of left femur; right and left patella; proximal end of right tibia; distal $\frac{2}{3}$ rd of left tibia with talus adherent (arthritic ankle joint); fragments of fibula and foot bones.
- 67 Skl. H 803A. Adult; male. Skull represented by fragments of occipital bone and one lumbar vertebra.
- 68 Skl. H 804. Adult; female. Skull incomplete. Other bones include rib fragments; right and left humeri fragments; left ulna; shaft fragments of right and left radius; few wrist bones; right and left os coxae; shaft fragments of right femur; left femur; right and left patella; right tibia; fragments of right tibia with talus and calcaneum; shaft fragments of right and left fibula; right cuneiform 3rd, cuboid 1, and metatarsal 3.
- 69 Skl. H 804. Adult; male. Proximal $\frac{2}{3}$ rd of right femur and shaft of left radius.
- 70 Skl. H 805. Adult, fairly old in age; female. Skull not well preserved and had to be restored; 2nd cervical vertebra, part of right scapula; part of right clavicle; proximal $\frac{2}{3}$ rd of right humerus; distal ends of a radius; right tibia; shaft pieces of fibula; left talus; some hand and foot bones.
- 71 Skl. H 805A. Adult, about 21-25 years; female. Skull represented by right frontal bone only. Other skeletal parts include cervical vertebrae 15th in one mass; thoracic vertebrae 4th-8th in one mass and 9th and 10th in one mass; fragments of lumbar vertebrae; rib fragments; pieces of right scapula; lateral $\frac{2}{3}$ rd of right clavicle; shaft fragments of humerus; shaft fragments of right and left ulna; complete left radius; metacarpal 5; proximal phalange 3; shaft fragments of left tibia; shaft fragments of left fibula; navicular 1 and left cuboid.
- 72 Skl. H 806. Adult; male. Skull with mandible complete; cervical vertebrae 5, rib fragments, acromion processes of right and left scapula; middle part of left clavicle; shaft fragments of humerus; proximal parts of right and left ulna; broken parts of left radius; right carpal bone 1, metacarpal 1, proximal phalange (hand) 3; fragments of pelvis; shaft fragments of right femur; left femur with patella adherent to distal end; shaft fragments of right and left tibia; talus 1; calcaneum 1; metatarsophalangeal joint intact; terminal phalanx (foot) 1.
- 73 Skl. H 806A. Adult; female. Complete skull with mandible; several vertebrae; fragments of ribs; acromion and coracoid processes of scapulae; broken parts of clavicle; distal $\frac{3}{4}$ th of right humerus; complete left humerus; proximal $\frac{1}{2}$ of right and left ulna; fragments of right radius; carpal 2, metacarpal 4, phalange 2; broken parts of right os coxae; shaft fragments of right and left femur; right and left patella; shaft fragments of tibiae; shaft fragments of left fibulae; left foot with intact cuneiform, cuboid, metatarsal medial 4, phalanges.
- 74 Skl. H 807. Adult; sex (?). Shaft of right humerus; distal $\frac{3}{4}$ th of right ulna; proximal $\frac{1}{4}$ th of left radius; shaft fragments of femur; right tibia fragments and shaft fragments of left tibia.
- 75 Skl. H 808. Above 18 years; probably female. Rib fragments; coracoid process of scapula; shaft fragments of right humerus; shaft of left radius; carpal 3, metacarpal 2, phalange (hand) 8; broken piece of right hip-bone; fragments of femora; fragments of right tibia; right calcaneum 1, cuboid 1, right cuneiform 2; left navicular 1, left cuneiform 2, left cuboid 1; metatarsal 3, phalange 5.
- 76 Skl. H 810. 17-21 years; probably female. Skull incomplete but preserves part of parietal, left zygoma, fragments of occiput, broken part of right maxilla with 7 teeth (excepting M 3) intact; broken mandible showing all the teeth excepting M 3 which did not cut. Other skeletal parts consist of several vertebrae; rib pieces; head of scapula; nearly complete right humerus; shaft fragment of left humerus; ulna fragments; radius fragments; carpal 4; parts of right os coxae; fragments of right femur, distal end of left femur, patella 2, shaft fragments of tibia, shaft fragments of fibula, metatarsals 7, calcaneum (right) 1, right talus 1, right cuneiforms 3 and left talus.
- 77 Skl. H 811. Adult; male. Skull complete. Skeletal materials consist of broken left clavicle, right femur, fragments of fibula and first cervical vertebra.
- 78 Skl. H 811. Female adult, fragments of right humerus, shaft of right radius, fragments of pelvis, left scapula, right ulna fragments, left patella, shaft of left tibia and a few phalanges.
- 79 Skl. H 812. Adult; female. Skull complete and had to be restored. Other skeletal parts represented by odontoid process of second cervical vertebra, lumbar vertebrae 3, broken part of sacrum, head and shaft pieces of right humerus, proximal $\frac{3}{4}$ th of left humerus and shaft fragments of right and left tibia.
- 80 Skl. H 813. Adult, about 18-21 years; female. Skull represented by temporal bone and left zygoma. Other skeletons consist of broken mandible with some of its teeth in position, number of vertebrae, body of sacrum, rib fragments, broken parts of both right and left scapulae, fragments of clavicle, nearly complete right humerus, distal part of left humerus, ulna fragments, shaft of right radius, proximal phalanx 1, distal phalanx 1, right ischium piece, shaft fragments of right and left femur, left patella, shaft of left tibia and shaft fragments of left fibula.
- 81 Skl. H 814. Adult; female. Cervical vertebrae 5th, 6th and 7th in one mass; thoracic vertebrae 3 in one mass and 2 in another; and lumbar vertebrae 2 in one mass; many rib fragments, head and coracoid process of left scapula, complete right and left clavicle, broken right humerus, distal end of right radius, metacarpal (left) 1, proximal phalanx 1, os pubis, right patella, distal end of right tibia, fragments of left tibia, shaft fragments of fibula, cuneiform 1, metatarsal 1.
- 82 Skl. H 814 a. Adult; male. Skull incomplete, represented by portion of frontal bone, right zygomatic arch and greater part of the left parietal.
83. Skl. H 814 b. Skull represented by few fragmentary pieces; no mandible is preserved; other skeletal parts include rib fragments, left scapula, middle piece of left clavicle, head of right humerus, shaft fragments of left humerus, left ulna fragments, fragments of left radius, fragmentary pieces of pelvis, fragments of left tibia, metatarsal 2 and left talus.
- 84 Skl. H 814 c. Adult; female. Nearly complete right os coxae.
- 85 Skl. H 815. Adult, about 20 years; male. Complete mandible with 14 teeth intact. M 3 on both sides did not erupt. Teeth show considerable wearing. High degree of wearing of incisors definitely suggest an edge to edge bite. Other skeletal parts are represented by fragments of left femur only.
- 86 Skl. H 816. Skull nearly complete, skeletal materials consist of few vertebrae, head of right scapula, right and left clavicle, fragments of humerus, shaft fragments of both right and left ulna, shaft fragments of right radius, proximal phalanges (hand) 2, part of left hip-bone, shaft fragments of both right and left femur, shaft fragments of tibia and distal half of left fibula.
- 87 Skl. H 817. Adult, about 18-21 years; female. Skull not well preserved—greater portion of the occiput and occipital part of the basis cranii had to be reconstructed. Mandible is present. Skeletal materials consist of rib fragments, few pieces of thoracic and lumbar vertebrae, medial $\frac{2}{3}$ rd of right clavicle, shaft fragments of left humerus, left ulna fragments, shaft fragments of both radii, metatarsals 2, fragments of pelvis, fragments of femora, fragments of tibiae, broken shaft of fibula and proximal phalanges (foot) 4.
- 88 Skl. H 818. Adult; male. Skull complete. Other skeletal materials include few vertebrae, sacrum piece with completely sacralized 5th lumbar vertebra, few ribs, broken pieces of right and left scapula, fragments of clavicle, shaft of right humerus, complete left humerus, shaft of a radius, phalanges 2, fragments of pelvis, fragments of right femur, right and left patella, complete left tibia, shaft fragments of fibula, left calcaneum 1, left talus, left

- cuboid 1, right talus, navicular 1, right metatarsal 1 and proximal phalanx (foot) 1.
- 89 Skl. H 819. Juvenile; female. Skull represented by right sagittal half without mastoid process. Other skeletal parts include right-half of mandible, few vertebrae, 32 rib fragments, clavicle fragments, fragments of radius, metatarsal 1, metacarpal 1, proximal phalanges (hand) 3, shaft fragments of femur, shaft fragments of right tibia, broken shaft of left fibula, right and left talus, right navicular, right cuneiform 1, metatarsals 2, proximal phalanx (foot) 1 and distal phalanx (foot) 1.
- 90 Skl. H 820. Adult, about 25 years. Skull represented by few fragments and isolated incisor tooth. Other skeletons are as follows: 2nd cervical vertebra, fragments of few thoracic and lumbar vertebrae, sacrum, many rib fragments, broken part of right scapula, complete left scapula parts of left clavicle, broken parts of humerus, shaft fragments of radius, shaft of an ulna, carpals 7, proximal phalanges 2, intermediate phalanges 2, broken parts of right and left os coxae (left os coxae having fused ischial tuberosity apophysis), proximal half of left femur, shaft fragments of right femur, complete right and left patella, shaft fragments of both right and left tibia, shaft fragments of fibula, right calcaneum 1, right talus, right navicular, proximal phalanges 3 and cuneiforms 5.
- 91 Skl. H 820 I. Adult; female. Complete right tibia.
- 92 Skl. H 820 C. Adult; female. Nearly complete left ulna distal end missing.
- 93 Skl. H 820 (II). Adult; female. Skull complete. No mandible.
- 94 Skl. H 820 (III). Adult; female. Skull incomplete, mandible broken.
- 95 Skl. H 820 (III). Adult; male. Skull nearly complete and well-preserved. Only portion of left frontal and parietal bone is missing.
- 96 Skl. H 821. Adult; male. Skull fragments, several vertebrae, sacrum piece, sternum, rib fragments, left scapula, fragments of right clavicle, distal portion of right humerus, left humerus fragments 3, fragments of right ulna (belonging to two individuals), shaft fragments of right radius, carpals 2, phalanges 2, fragments of os coxae, shaft fragments of right and left femur, right and left patella fragments of right tibia, nearly complete left tibia, fibula fragments 5, left calcaneum 1, sustentaculum tali 1, right and left talus, right navicular, left cuboid, left cuneiform 2, metatarsals 1, phalanges 4.

- 104 Skl. 3. Female, about 16-20 years. Skull with mandible incomplete and badly warped.
- 105 Skl. 7. Adult, sex (?). Two typical cervical vertebrae and few rib fragments.
- 106 Skl. 8. Adult; sex (?). Head of a right femur.
- 107 Skl. 9. Adult; sex (?). Metacarpal fragments and phalanges (hand).
- 108 Skl. 10. Adult; male. Skull complete with mandible. Other skeletons include several vertebrae, left side of a sacrum, broken ribs, acromion process of right scapula, acromion and coracoid processes of left scapula, complete right humerus, complete left ulna, distal end of left radius, carpals 6, metacarpals 5, phalanges 9, broken parts of right and left os coxae, right and left femora, both tibia, left fibula, left calcaneum, left tarsal, phalanges (foot) 5 and metatarsal 1.

AREA G

DIVISION I

- 1 Skl. I S 1. Child, about 5-6 years. Skull complete, without mandible; size small, frontal bone marked with a depressed groove in the mid-sagittal plane (pl. XXXI fig. 1). Parieto-occipital region also shows depressed fracture; first and second milk molars of both the sides are intact, and permanent first molar lies deep in the socket.
- 2 Skl. I S 11. Adult, 30-40 years; male. Skull complete with mandible.
- 3 Skl. I S 13. Young adult, 21-25 years; female. Skull without mandible, size small, not well preserved.
- 4 Skl. I S 15. Child, 7-9 years. Skull very small without mandible; not well preserved.

DIVISION II

- 5 Skl. II S 2. Adult; sex (?). Skull fragments with several teeth.
- 6 Skl. II S 5. Adult, 25-30 years; female. Skull complete without mandible.
- 7 Skl. II S 18. Adult, 25-30 years; male. Skull complete.
- 8 Skl. II S 36. Adult; female. Skull incomplete and in pieces, all the sixteen maxillary teeth intact.
- 9 Skl. II S 42. Adult, 25-30 years; male. Skull without mandible.

DIVISION III

- 10 Skl. III S 1. Infant, 2-5 years. Skull very small, without mandible; reconstructed; maxillary teeth represented by right deciduous cuspids. First and second milk molars and

- 2 Skl B 10 Adult; sex (?) Fragments of left temporal bone, occipital bone; left condyloid process of mandible, right shaft of humerus
- 3 Skl B 722. Adult; female Parts of occipital bone, right half of the mandible, rib fragments, scapula pieces 2, broken part of right clavicle, 5th metacarpal (1st), acetabulum fragment, shaft fragments of right and left femur, fragment of right tibia, distal end of left fibula.
- 4 Skl. B 1556 Child Skull—lower half of the frontal bone
- 5 Skl Mound AB (Recent) Adult, 21-25 years, probably female Skull with mandible complete
- 6 Skl HP XXX No 121. Child, about 89 years Skull incomplete, greater portion of the face and right side being missing
- 7 Skl. 783 Adult, sex (?) Left patella found mixed up with animal bones
- 8 Skl 789 Adult, probably female Left Os coxae.
- 9 Skl 1899 Adult, male Broken parts of pelvis
- 10 Skl 3110 Child First and second cervical vertebrae, coracoid process of right scapula; shaft fragments of both humeri, fragments of radius, shaft fragments of right and left femur, broken parts of fibulae.
- 11 Skl 3110 A Adult, probably male Incomplete mandible having inverted gonial angles and prominent chin
- 12 Skl 3110 C Adult 10-50 years, male Skull represented by left sagittal half; no mandible
- 13 Skl 3110 D Adult 25-30 years; probably female Skull incomplete Endocranial brain cast.
- 14 Skl 3161. Adult; sex (?) Ninth thoracic vertebra
15. Skl. 7740 Adult, sex (?) Broken part of left fibula
- 16 Skl 11635 Adult, 52-30 years, male Skull complete with mandible, second cervical vertebra and body of a typical thoracic vertebra, broken part of right scapula, medial $\frac{2}{3}$ ids of right clavicle, shaft fragments of right and left humerus
- 17 Skl P III 76 Young adult; probably female Skull represented by parietal temporal and maxilla of the right side, 5th metacarpal (right) proximal phalanx (hand) 1.
- 18 Skl P III 76 Child Proximal $\frac{2}{3}$ id of right humerus.
- 19 Skl P IV 95 b Infant Skull parts include parietal and orbital bone of the right side with fragments of mandible; vertebral bodies 5 tiny ribs 12, left scapula right and left clavicle, complete right and left humerus proximal part of right ulna, complete right radius, phalanx 1, complete right femur broken parts of left femur, shaft fragments of tibiae, distal $\frac{2}{3}$ id of right fibula and complete left fibula
- 20 Skl Mound F IV. Adult Sex (?). First cervical vertebra, rib fragments 2, fragments of left scapula, broken parts of right clavicle, distal part of right tibia
- 21 Skl Mound F X. Adult, male Skull fragments; rib fragments 2, broken part of right ulna, part of a radius, shafts of right and left femur, fragments of tibiae and first; metatarsal (right)
- 22 Skl Mound F 3686 A Adult, female Nearly complete left tibia
- 23 Skl Mound J (I) Infant. Right orbit and right zygoma; cervical vertebra 1, head and spine of right scapula, proximal part of right ulna, shaft fragment of left femur, tibia and fibula fragments
- 24 Skl Mound J (II) Child 3-6 years Right orbit, part of parietal bone, fragments of vertebra, rib fragments, complete left humerus, nearly complete right femur, proximal part of right tibia distal part of left fibula
- 25 Skl Mound J Child, 6-9 years Skull represented by right orbit, right parietal and right temporal, right half of mandible, left scapula, proximal part of right humerus, shaft of left ulna, shaft of right radius, complete left radius, metacarpals 3, proximal phalanges (hand) 5, fragments of pelvis, shaft fragments of right tibia broken parts of right fibula, proximal phalanges (foot) 3

CEMETERY H STRATUM II (Open Burials)

- 1 Skl H 88 Adult, about 25-30 years, female Skull incomplete; mandible in two pieces, cervical vertebrae 6th and 7th thoracic 1st, lumbar 1st to 3rd in one mass, osteoarthritic change noticed at 4th body piece fragmentary left & right scapulae, lateral third of right clavicle, complete left clavicle, fragmentary humeri;

right ulna in two pieces; left ulna broken; right and left radius incomplete, metacarpal 1st 2nd and 5th, proximal phalanx 5; Intermediate 4 and distal 4, incomplete pelvis having wide greater sciatic notch; right and left femora, right patella; both the tibiae in pieces; incomplete fibulae; left talus; left calcaneum and phalanx 1.

- 2 Skl. H 181 (K) Adult, about 25-30 years, male Incomplete disintegrated skull; cervical vertebrae 1st to 3rd in fragmentary condition, thoracic 3rd to 7th in one mass and 12th one lumbar having osteoarthritic change; sternum, fragmentary scapulae; medial third of right clavicle; distal half of right humerus, complete left humerus; right ulna having a fracture at distal end; left ulna in pieces; broken radii; incomplete pelvis having greater sciatic notch; both the femora in pieces, incomplete tibia; right and left fibulae in pieces; head of right talus fractured and twisted, 2nd cuneiform of left, right carpal 1st, 3rd and 4th, metacarpal 1st, and 5th, proximal phalanx 5; left carpal 1st, 2nd, 5th to 8th; metacarpal 1st, and, 4th and 5th, proximal phalanx 5 Intermediate 4, distal 1
- 3 Skl H 306 (n) Adult, about 18-25 year, female. Disintegrated skull; broken mandible, cervical vertebrae 1st, 2nd, and 3rd to 5th in one mass, thoracic typical, 2nd to 12th in five separate masses, lumbar 3 sacrum in pieces, both scapulae in fragmentary condition, right clavicle in two pieces, and medial two third of left both humeri having fused epiphyses; incomplete right and left ulna, right radius distal half and left incomplete right metacarpal (hand) 5, left carpal 2nd 7th and 8th, metacarpal 5, phalanx proximal 5, intermediate 4 broken femora in pieces; pieces of right and left patella, decayed right tibia, left tibia slightly bowed medially having fused epiphyses; right and left fibulae in pieces, tarsal calcaneum, talus, navicular, cuneiform 3, cuboid, metatarsal 5 of right foot, tarsals, navicular cuneiform 3 cuboid, metatarsal medial 1 and phalange (toe) one of left foot
- 4 Skl H 307 (a) Adult, about 10-50 years male Decayed skull, no mandible, cervical vertebrae typical 2 thoracic 2, lumbar 1 to 5 body only, right hip bone with fused epiphyses; broken femora
- 5 Skl H 481 (n) Adult, about 25-30 years male Incomplete skull; cervical vertebrae 5th, 6th 7th in one mass, thoracic 1st to 12th in five masses, flattened sacrum piece, sternum not fused; fragmentary scapulae, incomplete humeri; right ulna full, left ulna distal third broken and incomplete radii; right carpal 1st, 3rd to 5th 7th, 8th left carpal 1st, 3rd and 4th; phalanx proximal 3 intermediate 3, terminal 1; pelvis incomplete having fused crest epiphyses, fragmentary femora, tibiae in pieces fibulae incomplete, right tarsals navicular, cuneiform 3 cuboid; left navicular, cuneiform 3 right calcaneum broken having big sustentaculum tali left calcaneum broken, left talus, metatarsals right 5 phalanx proximal 3, intermediate 1, terminal 3
- 6 Skl H 187. Juvenile, 12-14 years female Fragmentary skull and mandible bones, 14 intact mandibular teeth without 3rd molars thoracic vertebrae 3 in one mass; other fragmentary pieces of vertebrae sternum, incomplete scapulae, clavicle right complete two third of right humerus, shaft piece of left humerus, shaft of right ulna, right capitate; phalanx proximal 3 intermediate 1; left hip bone without epiphysis union, shaft pieces of femora, shaft pieces of tibiae, calcaneum right apophysis not fused; right and left talus fragments, left and right navicular; right cuneiform 3, left 3rd, left cuboid; right metatarsal 5, left 1st and 2nd, phalanx proximal 7.
- 7 Skl. H 488 [H 487 (a)]. Adult, 25-30 years; male. Skull damaged by the action of saltpetre No reference to number H 488 could be found and in place No H 487 (a) has been considered as indicated by Vat (1840, 224)
- 8 Skl. H 488*. Adult, 25-30 years; female Incomplete skull; cervical vertebrae 4th to 7th and body piece of 1st and 2nd; thoracic vertebrae 1st to 11th, lumbar 1st to 5th in fragments; sacrum with coccyx 1st piece fused; manubrium and body separate, scapulae fragmentary, right clavicle curved at both curvatures; both humeri, left and right ulna, right and left radius; right carpal 2nd to 8th, metacarpal 5, phalanx proximal 5 relatively long, intermediate 4, terminal 2; left carpal 1st to 8th, metacarpal

- 2nd to 5th, finger phalange proximal 3, intermediate 1; pelvis incomplete having fused crest epiphyses; complete femora; patella right piece; left tibia; proximal and distal ends of right fibula; left tarsal, navicular; right calcaneum; right metatarsal 1st to 5th, toe phalange proximal 5, intermediate 1.
- 9 Skl. H 501 (a). Adult, 25-30 years; female. Incomplete and bilaterally compressed skull; fragmentary mandible pieces; vertebrae in several masses; sacrum; fragmentary scapulae; complete clavicles; both humeri with united epiphyses; shaft pieces of radii; fragmentary ulna pieces; left metacarpal 3rd; phalange proximal 1, intermediate 2. terminal 1, pelvis incomplete; left femur; right femur in pieces; left patella; right tibia; crumbling left tibia; fragmentary fibulae pieces; right calcaneum broken anteriorly; disintegrated right and left talus.
- 10 Skl. H 502 (G). Adult, above 25 years; male. Skull somewhat damaged; incomplete mandible; 16 intact mandibular teeth; cervical vertebrae 1st to 7th in separate masses; thoracic 1st to 12th in one mass; lumbar typical 2; disunited manubrium and body of sternum; complete 1st rib of both sides; decayed scapulae; right clavicle, left in two pieces; humerus left and right; radius right; left and right ulna; disintegrated pelvis having narrow greater sciatic notch; both femora repaired; broken right patella, left complete; left tibia; fragmentary fibulae; left calcaneum medially eroded; left cuboid.
- 11 Skl. H 503 I. Adult; male. Fragmentary skull bones; head and spine portion of right scapula; middle portion of left clavicle; broken pieces of left humerus; head and trochanter piece of one femur.
- 12 Skl. H 503 II. Child, about 6-12 years. Coccyx piece very small; humerus right shaft; proximal shaft of radius; hip-bone, ilium piece separate.
- 13 Skl. 636. Adult, probably male. Distorted and incomplete skull; right clavicle; fragmentary shaft piece of humeri; pieces of left and right ulnae; pieces of right and left femur; left patella; right tibia; talus right and left; calcaneum left; right cuneiform 3; left 2nd and 3rd navicular; cuboid left piece; right metatarsal 3rd; left 5th and phalange proximal 1.
- 14 Skl. H 694. Adult, above 25 years; male. Head, coracoid process and spine of left scapula; complete left humerus having united epiphysis.
- 15 Skl. H 695. Adult, 25-30 years; male. Skull slightly disintegrated by action of saltpetre; scapula right and left in pieces; complete right clavicle; right humerus; proximal pieces of right of left ulnae; proximal pieces of both radii; right metacarpal 2nd and 3rd; phalange proximal 4, intermediate 1, distal 1; left hip-bone disintegrated; femur left shaft; right tibia in pieces; distal pieces of one extra tibia; proximal part of left tibia; fragmentary fibulae; phalange proximal 2, distal 1.
- 16 Skl. H 696. Adult, 25-30 years; male. Fragmentary skull portion; thoracic vertebrae 11th and 12th, lumbar 1st; right humerus; distal half of left humerus; pieces of right and left ulnae; distal end of left radius; metacarpal right 2nd to 5th, left 1st to 5th; phalange proximal 9, intermediate 5 and distal 1, fragmentary hip-bone; fragmentary pieces of femora; broken right tibia; pieces of left tibia; left fibula; shaft piece of right fibula; right calcaneum, talus and navicular of both sides; right cuneiform 2nd and 3rd, left 3rd; cuboid right and left; right metatarsal 1st to 5th, left 1st to 4th, toe phalanges 1st marked by flipping of edges; phalange proximal 8, intermediate 4, terminal 1. Extra left navicular 1st; left capitate 1st; distal shaft piece of right femur.
- 17 Skl. H 697. Adult, above 25 years; male. Skull badly crushed, incomplete and flattened bilaterally; mandible surviving partly; cervical vertebrae lower 3 and thoracic upper 2 in one mass; lumbar fragment of 5th, fragment of sacrum; right scapula; left clavical; shaft of right humerus; left humeri in pieces; right and left ulnae; fragmentary left radius; right navicular, lunate, triquetrum, pisiform, capitate all in one mass; hamate; metacarpal left 1st, 6th to 8th; phalange proximal 8, intermediate 3, distal 3; right hip-bone with fused crest epiphysis; left hip-bone with separate piece of os pubis; piece of right femur; shaft pieces of left tibia; fragmentary fibulae; right calcaneum; navicular, cuneiform 2nd and left 3rd, left cuboid 1st; talus fragments; right metatarsal 1st, 2nd, 5th and left 1st to 5th.
- 18 Skl. H 698. Adult, 25-30 years; male. Complete skull and mandible; cervical vertebrae 1st to 4th; thoracic 3rd to 12th in three masses; lumbar 1st and 2nd; complete sacrum; manubrium and body of sternum fused; head of right scapula with acromion and coracoid processes; head piece of left scapula, left clavicle; lateral third of right clavicle; shaft piece of right humerus; left humerus; right radius; left ulna; fragmentary right ulna, right carpal 1st to 3rd, 5th, 6th, 7th, and trace of 6th; incomplete pelvis with greater sciatic notch; right and left femora; shaft portion of tibiae; right and left patella; two pieces of left fibula; left calcaneum; left hamate; right talus.
- 19 Skl. H 699. Adult, 21-25 years; female. Skull with mandible in a locked-jaw condition; cervical vertebrae 3rd, 7th and typical 4; thoracic 1st to 7th having disunited annular epiphyses; sternum; pieces of ribs, head and axillary border of right scapula; fragmentary left scapula; pieces of clavicles; head piece and distal end of right humerus; shaft of left humerus; fragmentary pieces of left ulna; proximal piece of right radius; fragment of 1st left metacarpal; phalange proximal 4; a lot of fragmentary long bones.
- 20 Skl. H 700. Adult, below 25 years; female. Fragmentary skull bones; mandible in pieces; 14 mandibular teeth, cervical vertebrae 1st, 2nd, 6th and typical 2 of which annular epiphyses not united; thoracic 1st; right clavicle lateral third; pieces of right humerus; shaft piece of left humerus; shaft piece or right and left ulnae having fused epiphyses; fragmentary pieces of radii; right metacarpal 1st; fragments of left fibula; toe phalange proximal 1.
- 21 Skl. H 704. Child, about 12 years. Left parietal bone with prominent parietal eminence.
- 22 Skl. H 707. Adult, sex? Skull survived by parietal pieces; right half of mandible; medial part of right clavicle, shaft fragments of left humerus; fragmentary left and right ulna pieces; right radius with fused epiphysis.
- 23 Skl. H 708*. Adult, sex? Lumbar vertebrae 1st, 2nd, 3rd in one mass; lateral two third of right clavicle, left femur shaft of a child; shaft piece of fibula.
- 24 Skl. H 710. Adult, above 40 years; skull complete with mandible; cervical vertebrae 1st to 7th; caudal piece of sacrum; fragmentary left scapula; right clavicle in two pieces; left clavicle full curved and twisted slightly; humerus right full having sharp margins of bicipital groove; left radius complete; left carpal 1st to 3rd and 5th to 8th, metacarpal 5, phalange 4; right carpal 1st, 5th to 8th, metacarpal 5, phalange proximal 5, intermediate 3, distal and thumb one each; broken pelvis having wide greater sciatic notches; right femur without head; left femur complete; left and right patella; left and right tibia; right fibula; left fibula without head; left talus, navicular, cuneiform 3 and cuboid; left metatarsal 5, phalange proximal 5, distal great toe 1; right tarsal, navicular, cuneiform 3, cuboid; phalange 3, distal 2.
- 25 Skl. H 734 (a). Adult, sex? Shaft of left humerus in two pieces.
- 26 Skl. H 739* 1. Adult, sex? Rib fragments; piece of left scapula; left clavicle in two pieces; distal end of right humerus; fragmentary left humerus; shaft of left ulna in three pieces; a lot of unidentified fragmentary bones.

CEMETERY H STRATUM I (Jar Burials)

List of skeletal materials have been furnished by M. S. Vats in 'Excavations at Harappa', Vol. I, pp. 212-219, 242-245; and by R. E. M. Wheeler in 'Harappa 1946: The Defences and Cemetery R 37', pp. 89-90.

COLLECTIVE
TABLES

	M 52/M 51	M 52/M 51	M 54/M 55	M 61/M 60	M 63/M 62	M 68/M 65	M 66/M 65	M 45/M 8	M 48/M 17	M 40/M 1	M 9/M 45
No.	Orbital Index (right)	Orbital Index (left)	Nasal Index	Maxillo-alveolar Index	Palatal Index	Mandibular Index	Breadth Index of mandible	Trans. craniofacial Index	Vert. craniofacial Index	Longitudinal craniofacial Index	Jugo-frontal Index
CEMETERY R 37											
1	88.10	81.93?	41.51	106.03	76.09	—	—	—	53.18?	50.26?	—
2	—	—	—	111.48	—	90.91	83.84	—	55.04	54.92	—
3	79.59	89.13	47.79	118.64?	100.00?	—	—	92.76	49.27?	55.64?	72.34
4	88.89	77.11	49.02	—	76.60	—	—	—	52.71	52.69	—
5	78.65	88.75?	50.94	—	—	62.40	79.34	95.31	54.71	51.04?	68.18
6	92.31	95.00	52.34	115.00	75.47	60.38	71.54	—	58.11	56.74	—
7	73.49	73.49	53.00	106.90	78.00	—	—	95.42	52.85	55.03	77.60
8	—	82.56	—	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—	—	—	—
10	80.68	78.65	56.60	113.33	74.55	72.34	68.94	101.91?	54.30	55.03	69.66?
11	80.00	—	48.15?	—	78.72	—	—	—	54.41	61.41	—
12	78.16	75.00	52.08	—	95.35	64.91	85.09	93.85	—	—	—
13	66.67	75.90	54.17	118.58	97.73	—	—	102.99	45.19	53.53	70.29
14	79.76	71.43	57.94	—	—	60.74	74.81	97.86	53.05?	54.26	70.80
15	82.95	83.33	46.15	110.34	74.00	64.06	75.39	—	50.34	54.26	—
16	—	86.05	46.73	128.00?	—	—	—	—	—	—	—
17	84.44?	79.07	46.94	117.92	85.42	—	—	—	55.56	51.10	—
18	85.00	82.05	53.33?	128.00	95.24	—	—	—	48.46	51.09	—
19	80.49	—	—	—	—	—	—	—	—	—	—
20	76.19	79.52	47.92	106.90	85.42	—	—	—	51.18	—	—
21	—	—	55.56?	110.19	81.78	—	—	—	—	—	—
22	91.67?	—	—	—	—	—	—	93.43	—	—	73.60

[illegible]

[illegible]

No.	Calculated cranial capacity in cc.	M (1+8+17)	M 8/M 1	M 17/M 1	M 17/M 8	M 21/M 1	M 21/M 8	M 9/M 8	M 47/M 45	M 48/M 45	M 66/M 45
		3	Cranial module	Length-breadth Index	Length-height Index	Breadth-height Index	Length-auricular height Index	Breadth-auricular height Index	Transverse fronto-parietal Index	Total facial Index	Superior facial Index
CEMETERY R 37											
1	1355.66	151.50?	68.06	69.90?	102.69?	58.90	86.54	72.31	—	—	—
2	1375.33?	151.67	68.91	66.84	96.99	57.51?	83.46?	—	—	—	—
3	1605.68	159.83	79.79	71.92	90.13	63.52	79.61	67.11	—	47.87?	63.83
4	1367.30	148.67	70.43	69.35	98.47	62.37	88.55	75.57	—	—	—
5	1481.60	156.17	72.14	71.88	99.64	61.72	85.56	64.98	102.27	57.20	72.73
6	1336.67	148.50	75.84	74.44	98.15	64.04	84.44	70.37	—	—	—
7	1357.20	150.50	69.31	69.58	100.38	59.79	86.26	74.05	—	55.60	68.00?
8	—	—	—	—	—	—	—	71.11	—	—	—
9	1422.09?	152.00?	69.68?	72.87?	104.58	—	—	68.70	—	—	—
10	1335.42	149.33	69.31	67.72	97.71	58.47	84.35	70.99	88.76	52.06	60.67?
11	1389.77?	150.67?	71.74?	73.91	103.03?	64.67	90.15?	73.48?	—	—	—
12	1378.93	—	69.15	—	—	62.23	90.00	—	—	56.15	79.51
13	1400.84	151.00	72.83	73.37	100.75	64.40	88.43	72.39	—	44.20	—
14	1437.82	153.00?	74.47	69.68?	93.57?	61.17	82.14	69.29	89.78	50.73	73.72
15	1399.77	156.00	71.81	77.13	107.41	61.17	85.19	71.85	—	—	—
16	—	—	—	—	—	—	—	—	—	—	—
17	—	—	—	69.23	—	60.71	—	—	—	—	—
18	1198.35?	145.33?	66.30?	70.65	106.56?	58.70	88.52?	75.00?	—	—	—
19	—	—	—	—	—	—	—	—	—	—	—
20	1345.15	148.33	75.69	70.17	92.70	61.88	81.75	70.07	—	—	—
21	—	—	—	—	—	—	—	—	—	—	—
22	1145.86	—	72.99	—	—	59.77	81.89	72.44	—	—	—

COLLECTIVE TABLE: Crania — A

				M 1	M 8	M 2 a		M 17	M 9	M 21	M 25	M 24 b
				Maximum Cranial length	Maximum Cranial breadth	Nasion-inion length	Basion-bregma height	Minimum frontal breadth	Vertical porion height	Median sagittal arc	Vertical transversal arc	
Skl No.		Sex	Age									
METERY R 37												
1	H 779(e)	M	A	191.0	130.0	182.5	133.5?	94.0	112.5	—	295.0	
2	H 793	M	A	193.0	133.0	176.0	129.0	—	111.0?	395.0	298.0	
3	H 793(A)	M	A	190.5	152.0	173.0	137.0	102.0	121.0	397.0	322.0	
4	H 793(B)	M	A	186.0	131.0	174.0	129.0	99.0	116.0	385.0	301.0	
5	H 794	M	A	192.0	138.5	175.0	138.0	90.0	118.5	385.0	309.0	
6	H 796(B)	M	A	178.0	135.0	164.0	132.5	95.0	114.0	353.0	298.0	
7	H 798(A)	M	A	189.0	131.0	177.0	131.5	97.0	113.0	376.0	299.0	
8	H 798(B)	M	A	—	135.0	—	—	96.0	—	—	—	
9	H 798(C)	M	A	188.0?	131.0	—	137.0	90.0	—	—	—	
0	H 806	M	A	189.0	131.0	174.5	128.0	93.0	110.5	376.0	294.0	
1	H 811	M	A	184.0	132.0?	176.0	136.0	97.0	119.0	356.0	—	
12	H 818	M	A	188.0	130.0	170.0	—	—	117.0	378.0	—	
13	H 820(iii)	M	A	184.0	134.0	157.0	135.0	97.0	118.5	377.0	303.0	
4	Skl. 1	M	A	188.0	140.0	180.0	131.0?	97.0	115.0	380.0	305.0	
5	Skl. 10	M	A	188.0	135.0	179.0	145.0	97.0	115.0	367.0	304.0	
16	H 801(B)	M	Juv.	—	—	—	—	—	—	—	—	
17	H 779(a)	F	A	182.0	—	171.0	126.0	—	110.5	362.0	291.0?	
18	H 779(c)	F	A	184.0	122.0?	167.0	130.0	91.5	108.0	378.0	—	
19	H 779(d)	F	A	—	—	—	—	83.0	—	—	—	
20	H 780	F	A	181.0	137.0	173.0	127.0	96.0	112.0	364.0	314.0	
21	H 788	F	A	—	—	—	—	—	—	—	—	
22	H 791/A	F	A	174.0	127.0	165.0	—	92.0	104.0	—	297.0	

	M 23	M 40	M 48	M 47	M 45	M 55	M 54	M 50	M 51	M 51	M 52	M 52
No.	Horizontal circumference	Prosthion-basion line	Nasion-prosthion line	Nasion-gnathion line	Bizygomatic breadth	Nasal height	Nasal breadth	Ant. interorbital breadth	Orbital breadth (right)	Orbital breadth (left)	Orbital height (right)	Orbital height (left)
CEMETERY R 37												
1	522.0	96.0?	71.0	—	—	53.0	22.0	18.0	42.0	41.5?	37.0	34.0?
2	530.0	106.0	71.0	—	—	48.0	—	—	—	—	—	—
3	548.0	106.0?	67.5?	—	141.0	56.5	27.0	23.0	49.0	46.0	39.0	41.0
4	517.0	98.0	68.0	—	—	51.0	25.0	21.0	40.5	41.5	36.0	32.0
5	526.0	98.0?	75.5	135.0	132.0	53.0	27.0	19.0	44.5	40.0	35.0	35.5
6	500.0	101.0	77.0	132.0	—	53.5	28.0	23.0	39.0	40.0	36.0	38.0
7	523.0	104.0	69.5	—	125.0	50.0?	26.5	19.0	41.5	41.5	30.5	30.5
8	—	—	—	—	—	—	—	—	—	43.0	—	35.5
9	—	—	—	—	—	—	—	—	—	—	—	—
10	518.0	104.0	69.5	118.5	133.5?	53.0	30.0	20.0	44.0	44.5	35.5	35.0
11	508.0	113.0	74.0	—	—	54.0	26.0?	19.0	42.5	—	34.0	33.5
12	—	—	68.5	—	122.0	48.0	25.0	18.0	43.5	42.0	34.0	31.5
13	514.0	98.5	61.0	—	138.0	48.0	26.0	20.0	42.0	41.5	28.0	31.5
14	532.0	102.0	69.5	123.0	137.0	53.5	31.0	18.0	42.0	45.5	33.5	32.5
15	530.0	102.0	73.0	120.0	—	58.5	27.0	18.5	44.0	45.0	36.5	37.5
16	—	89.0	69.0	116.5	—	53.5	25.0	19.0	—	43.0	—	37.0
17	493.0?	93.0	70.0	—	—	49.0	23.0	15.0?	45.0?	43.0	38.0	34.0
18	—	94.0	63.0	—	—	45.0	24.0?	21.0	40.0	39.0	34.0	32.0
19	—	—	—	—	—	—	—	—	41.0	—	33.0	—
20	503.0	—	65.0	—	—	48.0	23.0	16.5	42.0	41.5	32.0	33.0
21	—	—	65.5	—	—	45.0	25.0?	—	—	—	—	—
22	491.0	—	—	—	125.0	—	—	20.0	36.0?	—	33.0?	—

No.	Crown index of maxillary teeth M 81 (1)/M 81						Crown index of mandibular teeth M 81 (1)/M 81					
	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3
CEMETERY R 37												
1	127.78	115.00	126.32	146.67	115.79	129.41	—	—	—	—	—	—
2	105.00	109.09	120.00	115.00	109.09	120.00	104.76	104.76	105.00	100.00	100.00	110.00
3	109.52	109.09	95.24	105.00	110.53	110.00	—	—	—	—	—	—
4	121.05	115.00	109.52	109.52	—	—	81.82	90.00	83.33	75.00	83.33	88.24
5	—	—	109.52	—	104.76	—	100.00	—	95.45	95.45	91.30	87.50
6	—	—	—	—	—	—	—	—	—	—	—	—
7	110.00	105.00	104.76	105.00	111.76	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—	—	—	—	—
10	109.09	—	115.00	105.00	—	—	105.00?	—	90.48	—	118.75	—
11	105.00	—	105.00	—	133.33	—	—	—	—	—	—	—
12	100.00	94.74	104.76	100.00	—	—	105.00	100.00	90.00	90.00	85.71	85.71
13	100.00	109.52	—	125.00	116.67	—	—	—	—	—	—	—
14	—	—	—	—	—	—	—	127.78?	—	—	—	85.71
15	104.55	115.00	117.65	122.22	—	—	100.00	104.76	116.67	116.67	105.88	105.56
16	105.00	109.09	—	105.26	—	—	90.91	86.96	90.00	85.71	—	—
17	100.00	—	94.74	—	—	94.12	—	—	83.33	83.33	82.35	77.78
18	—	—	—	88.89	—	92.86	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—	—	—	—
20	—	—	90.00	117.65	100.00	123.53	—	—	—	—	—	—
21	90.00	90.00	88.89	114.29	87.50	107.14	—	—	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—

COLLECTIVE TABLE - A Continued.

[illegible]

No.	Sk. No.	Sex	Age	M 1	M 8	M 2a	M 17	M 9	M 21	M 25	M 24b
				Maximum Cranial length	Maximum Cranial breadth	Nasion-inion length	Basion-bregma height	Minimum frontal breadth	Vertical porion height	Median sagittal arc	Vertical transversal arc

CEMETERY R 37

23	H 795/A	F	A	—	—	—	—	93.0	—	—	—
24	H 798/AI	F	A	171.0	138.0	162.0	—	89.0	111.0	358.0	313.0
25	H 798(a)	F	A	178.0	129.0	169.0	131.0	96.0	111.5	360.0?	297.0
26	H 801/A	F	A	184.0	131.5	169.0	135.0	90.0	119.0	387.0	308.0
27	H 804	F	A	—	—	—	—	89.0	—	—	—
28	H 805	F	A	186.5	132.0	174.0	128.0	—	117.0	385.0	315.0
29	H 806/A	F	A	195.0	139.0	181.0	—	93.0	120.0	—	325.0
30	H 812	F	A	182.0	125.0?	170.0	125.0	100.0	109.0	372.0	294.0
31	H 816	F	A	167.0	130.0	162.0	—	91.0	109.0	346.0	295.0
32	H 817	F	A	—	—	—	125.0?	93.0	107.5?	—	—
33	H 820(I)	F	A	181.0	129.0	166.0	125.0	94.0	113.0	366.0	309.0
34	H 820(II)	F	A	172.0?	—	—	—	97.0	—	—	—
35	Sk. 2	F	A	178.0	128.5	171.5	124.0	92.0	106.0?	353.0	289.0
36	H 798/A2	F	Juv.	166.0	128.0	155.0	116.0	87.0	102.0	330.0	275.0

AREA G

37	I S 11	M	A	188.5	135.0	174.0?	126.5	96.0	115.0	387.0	307.0
38	II S 18	M	A	179.0	142.0	170.0	133.0	106.5	115.0	365.0	315.0
39	II S 42	M	A	178.0	129.0	166.0	139.5	90.0?	—	363.0	303.0
40	III S 2	M	A	171.0	139.0	162.0	137.5	105.0	115.0	—	310.0

	M 23	M 40	M 48	M 47	M 45	M 55	M 54	M 50	M 51	M 51	M 52	M 52
No.	Horizontal circumference	Prosthion-basion line	Nasion-prosthion line	Nasion-gnathion line	Bizygomatic breadth	Nasal height	Nasal breadth	Ant. interorbital breadth	Orbital breadth (right)	Orbital breadth (left)	Orbital height (right)	Orbital height (left)

CEMETERY R 37

23	—	101.0	64.0	—	—	47.5	23.0	20.5	38.0	37.0	34.0	34.5
24	498.0	—	64.0	—	123.0	47.0	26.0	17.0	42.0	42.0	37.0	37.0
25	501.0	—	66.0	—	127.0	51.0	26.0	18.5	41.0	41.0	31.5	31.5
26	508.0	—	—	—	127.0	53.0	24.0	17.0	38.0	39.0	33.0	34.0
27	—	—	60.0	—	—	46.0	22.5	18.0	40.0	38.0	35.0	34.0
28	514.0	—	—	—	—	51.0	27.0	—	38.5	44.0	—	38.0
29	528.0	—	70.0	120.0	—	47.0	25.0	—	43.0	42.0	33.0	34.0
30	506.0	85.0	72.0	—	—	53.0	23.0	20.0	46.0	44.0	39.0	36.5
31	483.0	—	65.0	—	128.0	48.5	25.5	18.0	39.0	41.0	32.0	31.5
32	—	98.0	60.0	—	121.0?	48.5	24.5	14.0	41.0	40.0	33.0	33.5
33	504.0	—	—	—	—	42.0	28.5?	21.0	—	39.0	31.0	31.0
34	—	—	64.0	107.0	—	48.0	27.0	18.0	46.0	—	35.0	35.0
35	500.0	95.5	63.0	108.0	121.0	46.0	25.0	22.5	38.5	—	32.0	—
36	466.0	88.0	56.0	—	112.5	44.0	23.0	17.0	37.0	36.5	31.5	31.5

AREA G

37	520.0	93.5?	69.0?	119.0	—	51.0?	26.0	18.0	43.0	40.5	32.0	32.0
38	523.0	99.0	66.0	—	128.0	51.0	25.0	23.0	42.0	44.5	29.5	29.5
39	495.0	94.0	66.5	—	—	51.5	25.0	17.0	40.0	38.0	32.5	32.5
40	505.0	—	—	—	—	47.0	24.0	23.0	40.0	41.5	32.0	32.0

	M 60	M 61	M 62	M 63	M 66	M 65	M 70	M 71 (1)	M 71	M 69	M 68	M 79
No.	Maxillo-alveolar length	Maxillo-alveolar breadth	Palatal length	Palatal breadth	Bigonial breadth	Bicondylar breadth	Ht. of mandibular ramus	Max. breadth of mandibular ramus	Min. breadth of mandibular ramus	Ht. at mandibular symphysis	Mandibular length	Mandibular angle

CEMETERY R 37

23	59.0	63.0	46.0	40.0	—	—	—	—	—	—	—	—
24	48.0	58.0	43.0	38.0	—	—	—	—	—	—	—	—
25	56.0	63.5	41.0	39.0	—	—	—	—	—	—	—	—
26	—	—	—	—	89.0	117.0	62.0	44.0	36.0	31.0	80.0	120.5°
27	—	—	—	—	78.0?	—	57.5	38.0	30.0	24.0	66.0	119.5°
28	—	—	—	—	—	—	—	—	—	—	—	—
29	56.0	59.0	47.0	40.0	79.0	104.0?	58.0	41.5	33.5	35.0	81.0	117.5°
30	—	—	—	—	—	—	—	—	—	—	—	—
31	—	—	—	—	—	—	—	—	—	—	—	—
32	55.0	65.5	41.0	40.0	—	—	—	—	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—
34	57.0	61.0	48.0	40.0	87.0	—	60.0	38.0	30.0	28.0	73.0	120°
35	55.5	62.0	40.0	40.0	70.0	104.0	57.5	38.0	30.5	26.0	78.0	116°
36	56.5	58.0	—	—	—	—	—	—	—	—	—	—

AREA G

37	54.0	56.0	52.0	39.0	85.0	120.0	67.0	47.0	37.0	35.0	83.5	113.5°
38	56.0	62.5	48.0	41.0	—	—	—	—	—	—	—	—
39	49.0	67.5	46.0	44.0	—	—	—	—	—	—	—	—
40	—	66.0	—	42.0	—	—	—	—	—	—	—	—

No.	Calculated cranial capacity in cc.	M (1+8+17) 3	M 8/M 1	M 17/M 1	M 17/M 8	M 21/M 1	M 21/M 8	M 9/M 8	M 47/M 45	M 48/M 45	M 66/M 45
		Cranial module	Length-breadth index	Length-height index	Breadth-height index	Length-auricular height index	Breadth-auricular height index	Transverse fronto-parietal index	Total facial index	Superior facial index	Jugo-mandibular index
CEMETERY R 37											
23	—	—	—	—	—	—	—	—	—	—	—
24	1279.47	—	80.70	—	—	64.91	80.43	64.49	—	52.03	—
25	1254.88	146.00	72.47	73.60	101.55	62.64	86.43	74.42	—	51.97	—
26	1387.61	150.17	71.47	73.37	102.66	64.67	90.49	68.44	—	—	70.08
27	—	—	—	—	—	—	—	—	—	—	—
28	1388.02	148.83	70.78	68.63	96.97	62.73	88.64	—	—	—	—
29	1542.89	—	71.28	—	—	61.54	86.33	66.91	—	—	—
30	1221.39?	144.00?	68.68?	68.68	100.00?	59.89	87.20?	80.00?	—	—	—
31	1174.23	—	77.84	—	—	65.27	83.85	70.00	—	50.78	—
32	—	—	—	—	—	—	—	—	—	49.59?	—
33	1287.40	145.00	71.27	69.06	96.90	62.43	87.60	72.87	—	—	—
34	—	—	—	—	—	—	—	—	—	—	—
35	1198.42?	143.50	72.19	69.66	96.50	59.55?	82.49?	71.60	89.26	52.07	57.85
36	—	136.67	77.11	69.88	90.62	61.45	79.69	67.97	—	49.78	—

AREA G

37	1402.50	150.00	71.62	67.11	93.70	61.01	85.19	71.11	—	—	—
38	1401.31	151.33	79.33	74.30	93.66	64.25	80.99	75.00	—	51.56	—
39	1376.65	148.83	72.47	78.37	108.14	—	—	69.77?	—	—	—
40	1334.56	149.17	81.29	80.41	98.92	67.25	82.73	75.54	—	—	—

No.	M 52/M 51	M 52/M 51	M 54/M 55	M 61/M 60	M 63/M 62	M 68/M 65	M 66/M 65	M 45/M 8	M 48/M 17	M 40/M 1	M 9/M 45
	Orbital index (right)	Orbital index (left)	Nasal index	Maxillo-alveolar index	Palatal index	Mandibular index	Breadth index of mandible	Trans. craniofacial index	Vert. craniofacial index	Longitudinal craniofacial index	Jugo-frontal index
CEMETERY R 37											
23	89.47	93.24	48.42	106.78	86.96	—	—	—	—	—	—
24	88.10	88.10	55.32	120.83	88.37	—	—	89.13	—	—	72.36
25	76.83	76.83	50.98	113.39	95.12	—	—	98.45	50.38	—	75.59
26	86.84	87.18	45.28	—	—	68.38	76.07	96.58	—	—	70.87
27	87.50	89.47	48.91	—	—	—	—	—	—	—	—
28	—	86.36	52.94	—	—	—	—	—	—	—	—
29	76.74	80.95	53.19	105.36	85.11	77.88?	75.96?	—	—	—	—
30	84.78	82.95	43.40	—	—	—	—	—	57.60	46.70	—
31	82.05	76.83	52.58	—	—	—	—	98.46	—	—	71.09
32	80.49	83.75	50.52	119.09	97.56	—	—	—	48.00?	—	76.86?
33	—	79.49	67.86	—	—	—	—	—	—	—	—
34	76.09	—	56.25	107.02	83.33	—	—	—	—	—	—
35	83.12	—	54.35	111.71	100.00	75.00	67.31	94.16	50.81	53.65	76.03
36	85.14	86.30	52.27	102.65	—	—	—	87.89	48.28	53.01	77.33

AREA G

37	74.42	79.01	50.98?	103.70	75.00	69.58	70.83	—	54.55?	49.60?	—
38	70.24	66.29	49.02	111.61	85.42	—	—	90.14	49.62	55.31	83.20
39	81.25	85.53	48.54	137.76	95.65	—	—	—	47.67	52.81	—
40	80.00	77.11	51.06	—	—	—	—	—	—	—	—

M a x i l l a r y t e e t h												
No.	M 81 Mesiodistal crown diam. Right M 1	M 81 (1) Labiolingual crown diam. Right M 1	M 81 Mesiodistal crown diam. Left M 1	M 81 (1) Labiolingual crown diam. Left M 1	M 81 Mesiodistal crown diam. Right M 2	M 81 (1) Labiolingual crown diam. Right M 2	M 81 Mesiodistal crown diam. Left M 2	M 81 (1) Labiolingual crown diam. Left M 2	M 81 Mesiodistal crown diam. Right M 3	M 81 (1) Labiolingual crown diam. Right M 3	M 81 (1) Mesiodistal crown diam. Left M 3	M 81 Labiolingual crown diam. Left M 3
CEMETERY R 37												
23	10.0	9.0	10.0	10.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
24	—	—	—	—	—	—	—	—	—	—	—	—
25	10.0	12.0	10.0	12.0	10.0	11.0	11.0	11.5	9.0	10.0	9.0	9.0
26	—	—	—	—	—	—	—	—	—	—	—	—
27	—	—	—	—	—	—	—	—	—	—	—	—
28	—	—	—	—	—	—	—	—	—	—	—	—
29	10.0	10.5	10.0	11.0	10.0	10.0	10.0	10.5	8.0	8.5	8.0	8.0
30	—	—	—	—	—	—	—	—	—	—	—	—
31	—	—	—	—	—	—	—	—	—	—	—	—
32	10.5	11.0	10.5	11.0	10.0	11.5	11.5	14.0	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—
34	—	—	—	—	—	—	—	—	—	—	—	—
0.01 35	10.0	11.5	10.0	11.0	9.5	10.5	9.5	11.0	9.5	10.0	9.5	—
36	9.5	10.5	10.5	10.0	9.5	10.0	9.5	10.0	—	—	—	—

AREA G

0.01 37	10.0	11.0	11.0	11.5	10.0	12.5	11.0	—	9.5	11.0	—	—
38	10.5	12.0	10.0	11.5	9.5	11.0	14.0	10.0	8.5	10.0	9.5	8.5
39	10.0	11.5	11.5	11.5	9.0	11.0	10.0	10.5	9.5	12.0	9.5	12.0
40	11.0	11.5	11.0	12.0	11.0	12.0	9.5	14.5	9.5	10.5	8.5	10.0

M a n d i b u l a r t e e t h

[illegible]

CEMETERY R 37

[illegible]

AREA G

[illegible]

No.	Crown Index of maxillary teeth MBI (1)/MBI						Crown Index of mandibular teeth MBI (1)/MBI					
	Right M1	Left M1	Right M2	Left M2	Right M3	Left M3	Right M1	Left M1	Right M2	Left M2	Right M3	Left M3
CEMETERY R 37												
23	90.00	100.00	111.11	100.00	100.00	100.00	—	—	—	—	—	—
24	—	—	—	—	—	—	—	—	—	—	—	—
25	120.00	120.00	110.00	104.55	111.11	100.00	—	—	—	—	—	—
26	—	—	—	—	—	—	—	—	—	—	—	—
27	—	—	—	—	—	—	95.24	95.24	—	—	—	90.00
28	—	—	—	—	—	—	—	—	—	—	—	—
29	105.00	110.00	100.00	105.00	106.25	100.00	90.91	90.91	90.00	85.71	94.44	93.75
30	—	—	—	—	—	—	—	—	—	—	—	—
31	—	—	—	—	—	—	—	—	—	—	—	—
32	104.76	104.76	115.00	95.65	—	—	—	—	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—
34	—	—	—	—	—	—	—	—	—	—	—	—
35	115.00	110.00	110.53	115.79	—	—	90.91	105.00	105.00	116.67	100.00	111.11
36	110.53	95.24	105.26	105.26	—	—	—	—	—	—	—	—

AREA G

37	110.00	104.55	125.00	—	115.79	—	120.00	104.35	109.09	109.09	109.52	110.00
38	114.29	115.00	115.79	90.91	117.65	89.47	—	—	—	—	—	—
39	115.00	100.00	122.22	105.00	126.32	126.32	—	—	—	—	—	—
40	104.55	109.09	109.09	121.05	110.53	117.65	—	—	—	—	—	—

				M 1	M 8	M 2 a	M 17	M 9	M 21	M 25	M 24 b
No.	Skl No.	Sex	Age	Maximum Cranial length	Maximum Cranial breadth	Nasion-Inion length	Basion-bregma height	Minimum frontal breadth	Vertical porion height	Median sagittal arc	Vertical transversal arc
AREA G											
41	III S 22	M	A	182.0	144.0	168.0	128.0	101.0	109.0	354.0	300.0
42	III S 23	M	A	191.0	139.0	175.0	138.0	92.0	117.0	397.0	311.0
43	III S 47	M	A	176.0	138.0	166.0	132.0	99.0	115.0	370.0	303.0
44	I S 13	F	A	—	—	—	—	86.0	109.0?	354.0	—
45	II S 5	F	A	175.0	135.0	160.0	126.0	92.0	110.0	372.0	292.0
46	III S 21	F	A	174.0	125.0	157.0	123.0	90.0	105.0	—	277.0
47	I S 1		Ch	166.0	126.0	157.0	110.0	—	101.0	343.0	301.0
48	I S 15		Ch	174.0	—	158.0	119.0	92.0	102.0	352.0	297.0?
49	III S 1		Ch	155.0?	—	—	—	84.0	—	—	—
50	III S 4		Ch	160.0	129.0	—	—	83.0?	—	350.0	323.0?
51	III S 8		Ch	166.0	111.0	—	109.0	83.0	99.0	342.0	277.0

MOUND AB

52	H 11635	M	A	182.0	133.0	175.0	135.0	92.0	114.0	375.0	309.0
53	5440 D	F	A	193.0?	135.0	—	—	99.0	—	—	319.0
54	Mound AB (Rec.)	F	A	179.0	125.0	169.0	136.0	93.0	109.0	359.0	298.0
55	H.P. XXX 421		Ch	166.0	127.0	155.0	123.0	86.0	104.5	340.0	307.0

	M 23	M 40	M 48	M 47	M 45	M 55	M 54	M 50	M 51	M 51	M 52	M 52
No.	Horizontal circumference	Prosthion-basion line	Nasion-prosthion line	Nasion-gnathion line	Bizygomatic breadth	Nasal height	Nasal breadth	Ant. Interorbital breadth	Orbital breadth (right)	Orbital breadth (left)	Orbital height (right)	Orbital height (left)
AREA G												
41	515.0	94.0	66.5	—	133.0	53.0	29.0	22.5	44.0	41.0	33.0	34.0
42	523.0	96.0	70.0	—	123.0	52.5	26.0	17.0	39.0	39.5	32.0	30.5
43	505.0	92.0	61.5	—	127.5	49.0	25.0	21.5	40.0	39.0	32.0	34.5
44	—	—	—	—	110.0?	42.0?	23.5	17.0?	35.0	35.5?	28.0	29.0
45	490.0	93.0	67.0	—	118.5	47.0	23.0	15.0	42.0	40.5	32.0	32.0
46	486.0	90.5	66.0	—	121.0	48.5	24.0	20.0	39.5	39.5	34.0	34.0
47	473.0	73.0	42.0	—	—	31.5	—	14.0	34.0	—	35.0?	—
48	—	—	54.0	—	106.0	42.0	21.0	16.0	36.0	34.0	28.0	28.5
49	—	74.0	46.5	—	—	33.5	20.0	18.0	33.0	32.0	28.5	31.5
50	449.0	—	—	—	—	—	—	—	—	—	—	—
51	448.0	—	44.0	—	—	31.0	18.0	17.5	35.0	32.5	29.5	28.5

MOUND AB

52	506.0	92.5	69.0	116.0	134.0	52.5	27.0	21.0	42.0	42.5	35.0	35.0
53	530.0?	—	—	—	—	—	—	—	—	—	—	—
54	495.0	100.0	66.0	113.0	—	48.0	22.0	22.0	39.0	—	32.0	33.0
55	471.0	—	—	—	—	—	—	17.0	—	—	—	32.0

No.	Calculated cranial capacity in cc.	M (1+8+17) 3	M 8/M 1	M 17/M 1	M 17/M 8	M 21/M 1	M 21/M 8	M 9/M 8	M 47/M 45	M 48/M 45	M 66/M 45
		Cranial module	Length-breadth Index	Length-height Index	Breadth-height Index	Length-auricular height Index	Breadth-auricular height Index	Transverse fronto-parietal Index	Total facial Index	Superior facial Index	Jugo-mandibular Index

AREA G

41	1377.94	151.33	79.12	70.33	88.89	59.89	75.69	70.14	—	50.00	—
42	1465.78	156.00	72.77	72.25	99.28	61.26	84.17	66.19	—	56.91	75.61
43	1355.57	148.67	78.41	75.00	95.65	65.34	83.33	71.74	—	48.24	—
44	—	—	—	—	—	—	—	—	—	—	—
45	1270.89	145.33	77.14	72.00	93.33	62.86	81.48	68.15	—	56.54	—
46	1139.85	140.67	71.84	70.69	98.40	60.34	84.00	72.00	—	54.55	—
47	—	134.00	75.90	66.27	87.30	60.84	80.16	—	—	—	—
48	—	—	—	68.39	—	58.62	—	—	—	50.94	—
49	—	—	—	—	—	—	—	—	—	—	—
50	—	—	80.62	—	—	—	—	64.34?	—	—	—
51	—	128.67	66.87	65.66	98.20	59.64	89.19	74.77	—	—	—

MOUND AB

52	1343.73	150.00	73.08	74.18	101.50	62.64	85.71	69.71	86.57	51.49	77.61
53	—	—	69.95?	—	—	—	—	73.33	—	—	—
54	1204.38	146.67	69.83	75.98	108.80	60.89	87.20	74.40	—	—	—
55	—	138.67	76.51	74.10	96.85	62.95	82.28	67.72	—	—	—

D

No.	M 52/M 51	M 52/M 51	M 54/M 55	M 61/M 60	M 63/M 62	M 68/M 65	M 66/M 65	M 45/M 8	M 48/M 17	M 40/M 1	M 9/M 45
	Orbital index (right)	Orbital index (left)	Nasal index	Maxillo-alveolar index	Palatal index	Mandibular index	Breadth index of mandible	Trans. craniofacial index	Vert. craniofacial index	Longitudinal craniofacial index	Jugo-frontal index
AREA G											75.94
41.	75.00	82.93	54.72	—	106.67	—	—	92.36	51.95	51.65	74.80
42.	82.05	77.22	49.52	122.61	92.16	72.17?	80.87?	88.49	50.72	50.26	77.65
43.	80.00	88.46	51.02	110.68	95.00	—	—	92.39	46.59	52.27	78.18?
44.	80.00	81.69?	55.95?	—	—	—	—	—	—	—	77.64
45.	76.19	79.01	48.94	109.48	81.63	—	—	87.78	53.17	53.14	74.38
46.	86.08	86.08	49.48	106.36	79.17	—	—	96.80	53.66	52.01	—
47.	102.94?	—	—	148.57	90.62	—	—	—	38.18	43.98	36.79
48.	77.78	83.82	50.00	132.56	97.06	—	—	—	45.38	—	—
49.	86.36	98.44	59.70	139.47	80.00	—	—	—	—	47.74?	—
50.	—	—	—	—	—	—	—	—	—	—	—
51.	82.86	87.69	58.06	134.62	76.92	—	—	—	40.37	—	—

MOUND AB

[illegible]

M a x i l l a r y t e e t h

No.	M 81 Mesiodistal crown diam. Right M 1	M 81 (1) Labiolingual crown diam. Right M 1	M 81 Mesiodistal crown diam. Left M 1	M 81 (1) Labiolingual crown diam. Left M 1	M 81 Mesiodistal crown diam. Right M 2	M 81 (1) Labiolingual crown diam. Right M 2	M 81 Mesiodistal crown diam. Left M 2	M 81 (1) Labiolingual crown diam. Left M 2	M 81 Mesiodistal crown diam. Right M 3	M 81 (1) Labiolingual crown diam. Right M 3	M 81 Mesiodistal crown diam. Left M 3	M 81 (1) Labiolingual crown diam. Left M 3
-----	--	---	---	--	--	---	---	--	--	---	---	--

AREA G

41	11.5	11.5	—	—	10.0	11.5	—	—	7.5	10.5	8.5	7.5
42	—	—	10.0	11.0	10.0	12.0	10.5	11.5	8.5	9.5	9.0	10.0
43	10.0	12.0	—	—	9.0	10.0	10.0	11.0	—	—	8.5	10.5
44	9.0	11.0	9.5	11.0	8.5	11.5	9.5	11.5	8.0	11.5	8.5	12.5
45	11.0	12.0	11.0	11.5	9.5	12.0	10.0	11.0	10.0	11.0	—	—
46	11.0	11.0	9.0	11.0	9.0	11.0	11.0	11.0	—	—	—	—
47	6.5	7.0	6.5	7.0	8.0	7.5	8.0	7.0	—	—	—	—
48	—	—	—	—	—	—	9.0	10.0	10.0	9.0	10.0	10.0
49	7.0	8.0	6.0	7.0	—	—	9.0	8.5	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	—	—
51	7.0	8.0	7.0	7.0	9.5	8.0	9.0	8.5	10.0	9.0	9.5	8.5

MOUND AB

52	9.0	11.0	9.0	10.5	—	—	—	—	—	—	—	—
53	10.0	9.0	—	—	8.5	10.0	—	—	—	—	—	—
54	11.0	11.0	11.0	11.0	9.0	10.0	11.0	9.0	—	—	—	—
55	—	—	7.0	8.0	—	—	9.0	8.0	—	—	—	—

M a n d i b u l a r t e e t h

[illegible]

AREA G

[illegible]

MOUND AB

[illegible]

No.	Crown index of maxillary teeth M 81 (1)/M 81						Crown index of mandibular teeth M 81 (1)/M 81					
	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3

AREA G

41	100.00	—	115.00	—	140.00	88.24	—	—	—	—	—	—
42	—	110.00	120.00	109.52	111.76	111.11	100.00	100.00	94.74	105.56	89.47	89.47
43	120.00	—	111.11	110.00	—	123.53	—	—	—	—	—	—
44	122.22	115.79	135.29	121.05	143.75	147.06	—	—	—	—	—	—
45	109.09	104.55	126.32	110.00	110.00	—	—	—	—	—	—	—
46	100.00	122.22	122.22	100.00	—	—	—	—	—	—	—	—
47	107.69	107.69	93.75	87.50	—	—	—	—	—	—	—	—
48	—	—	—	111.11	90.00	100.00	—	—	—	—	—	—
49	114.29	116.67	—	94.44	—	—	—	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	—	—
51	114.29	100.00	84.21	94.44	90.00	89.47	—	—	—	—	—	—

MOUND AB

52	122.22	116.67	—	—	—	—	—	—	—	—	—	—
53	90.00	—	117.65	—	—	—	—	—	—	—	—	—
54	100.00	100.00	111.11	81.82	—	—	86.96	90.91	105.56	90.00	100.00	90.00
55	—	114.29	—	88.89	—	—	—	—	—	—	—	—

[illegible][illegible][illegible]

No.	Skl No.	Sex	Age	M 1	M 8	M 2a	M 17	M 9	M 21	M 25	M 24b
				Maximum Cranial length	Maximum Cranial breadth	Nasion-Inion length	Basion-bregma height	Minimum frontal breadth	Vertical porion height	Median sagittal arc	Vertical transversal arc

CEMETERY H (OPEN BURIAL)

56	H184(K)	M	A	—	—	—	—	—	—	—	—
57	H307(a)	M	A	189.0	142.0	176.0	133.0	99.5	—	391.0	—
58	H484(a)	M	A	—	—	—	133.0	—	—	—	—
59	H 487 (a)	M	A	191.0	—	184.0	135.0	92.5	—	383.0	—
60	H 502 (G)	M	A	189.0	—	—	—	—	—	—	—
61	H 695	M	A	193.0	153.0?	176.0?	137.0	92.5	—	—	—
62	H 698	M	A	183.5	139.0	170.0	136.0	98.5	119.0	372.0	318.0
63	H 88	F	A	194.0	—	—	—	—	—	—	—
64	H 306 (a)	F	A	188.0?	—	—	—	—	—	—	—
65	H 488	F	A	183.5	132.0?	167.0	134.0	94.0	110.0	376.0	297.0
66	H 501 (a)	F	A	—	—	—	—	—	—	—	—
67	H 699	F	A	167.0	134.0	166.0	135.0	90.0	109.0	—	—
68	H 710	F	A	177.0	—	163.0	—	95.0	—	—	—

CEMETERY H (JAR BURIAL)

69	H 206 (B)	M	A	180.0?	138.0	—	—	—	—	—	312.0
70	H 255 (a)	M	A	198.0	135.0	180.0	134.0	98.5	118.0	384.0	307.0
71	H 344	M	A	184.0?	141.0	165.0	136.0	95.0	119.0	379.0	316.0
72	H 61	F	A	—	131.0	—	136.0	104.0	117.0	—	304.0
73	H 153 (a)	F	A	181.0	—	173.0	117.0?	89.0	—	355.0	—

	M 23	M 40	M 48	M 47	M 45	M 55	M 54	M 50	M 51	M 51	M 52	M 52
No.	Horizontal circumference	Prosthion-basion line	Nasion-prosthion line	Nasion-gnathion line	Elizygomatic breadth	Nasal height	Nasal breadth	Ant. interorbital breadth	Orbital breadth (right)	Orbital breadth (left)	Orbital height (right)	Orbital height (left)
CEMETERY H (OPEN BURIAL)												
56	—	—	72.0	—	—	53.5	26.5	22.0	41.5	—	—	—
57	537.0	—	—	—	—	53.0	—	29.5	45.0	—	31.0	—
58	—	100.0	—	—	—	—	27.5?	—	—	41.5	—	31.0
59	—	94.0	70.5	—	—	55.0	25.0	18.5	39.0	—	31.0	—
60	—	100.0	66.0	116.0	—	47.5	21.0	19.0?	—	37.5	—	36.5
61	540.0	95.0	75.0	—	—	54.5	28.0?	18.5	43.0	40.5	35.0	31.5
62	514.0	94.0	68.0	116.5	136.0	52.5	25.0	29.0	41.0	40.0	33.0	33.0
63	—	—	69.0	121.5	—	49.5	26.0	21.0	—	37.5	—	35.5
64	—	—	—	—	—	46.0	—	18.0	38.0	42.5	32.5	31.0
65	505.0?	—	—	—	—	39.0	26.0	18.0	42.0	40.0	31.0	30.0
66	—	100.0	71.0	121.0	120.0?	51.0	21.0	19.0	40.5	41.5	36.0	—
67	—	100.0	58.0	106.0	115.0	43.5	23.0	15.0	41.5	41.5	—	36.0
68	492.0	—	—	—	—	—	—	—	—	—	—	—

CEMETERY H (JAR BURIAL)

69	540.0	—	—	—	—	—	—	—	—	—	—	—
70	545.0	107.0	71.0	123.0	131.0	51.0	27.0	22.0	42.5	43.5	34.0	33.5
71	522.0	98.0	60.0	—	136.0	47.0	27.0	22.0	39.0	40.0	30.5	30.0
72	483.0	—	—	—	—	—	—	—	42.0	—	34.0	—
73	500.0	—	—	—	126.0	40.0?	22.0	15.0	—	—	—	—

No.	M 60	M 61	M 62	M 63	M 66	M 65	M 70	M 71 (1)	M 71	M 69	M 68	M 79
	Maxillo-alveolar length											
	Maxillo-alveolar breadth											
			Palatal length									
				Palatal breadth								
					Bigonial breadth							
						Bicondylar breadth						
						Ht. of mandibular ramus						
						Max. breadth of mandibular ramus						
						Min. breadth of mandibular ramus						
						Ht. at mandibular symphysis						
						Mandibular length						
						Mandibular angle						

CEMETERY H (OPEN BURIAL)

[illegible]

CEMETERY H (JAR BURIAL)

[illegible]

No.	Calculated cranial capacity in c.c.	M (1+8+17) 3	M 8/M 1	M 17/M 1	M 17/M 8	M 21/M 1	M 21/M 8	M 9/M 8	M 47/M 45	M 48/M 45	M 66/M 45
		Cranial module	Length-breadth index	Length-height index	Breadth-height index	Length-auricular height index	Breadth-auricular height index	Transverse fronto-parietal index	Total facial index	Superior facial index	Jugo-mandibular index

CEMETERY H (OPEN BURIAL)

56	—	—	—	—	—	—	—	—	—	—	—
57	1474.07	154.67	75.13	70.37	93.66	—	—	70.07	—	—	—
58	—	—	—	—	—	—	—	—	—	—	—
59	—	—	—	70.68	—	—	—	—	—	—	—
60	—	—	—	—	—	—	—	—	—	—	—
61	1600.70?	161.00?	79.27?	70.98	89.54?	—	—	60.46?	—	—	—
62	1440.81	152.83	↑	74.11	97.84	64.85	85.61	70.86	85.66	50.00	55.51
63	—	—	75.75	—	—	—	—	—	—	—	—
64	—	—	—	—	—	—	—	—	—	—	—
65	1298.21?	149.83?	↑	73.02	101.52?	59.95	83.33?	71.21?	—	—	—
66	—	—	71.93?	—	—	—	—	—	100.83?	59.17?	69.58?
67	1204.52	145.33	80.24	80.84	100.75	65.27	81.34	67.16	92.17	50.43	68.70
68	—	—	—	—	—	—	—	—	—	—	—

CEMETERY H (JAR BURIAL)

69	—	—	76.67?	—	—	—	—	—	—	—	—
70	1482.65	155.67	68.18	67.68	99.26	59.60	87.41	72.96	93.89	54.20	76.34
71	1459.13	153.67	76.63?	73.91?	96.45	64.67?	84.40	67.38	—	44.12	54.78
72	—	—	—	—	103.82	—	89.31	79.39	—	—	—
73	—	—	—	64.64?	—	—	—	—	—	—	—

No.	M 52/M 51	M 52/M 51	M 54/M 55	M 61/M 60	M 63/M 62	M 68/M 65	M 66/M 65	M 45/M 8	M 48/M 17	M 40/M 1	M 9/M 45
	Orbital index (right)	Orbital index (left)	Nasal index	Maxillo-alveolar index	Palatal index	Mandibular index	Breadth index of mandible	Trans. craniofacial index	Vert. craniofacial index	Longitudinal craniofacial index	Jugo-frontal index
CEMETERY H (OPEN BURIAL)											
56	—	—	49.53	119.23	67.71?	—	—	—	—	—	—
57	75 56	—	—	—	—	—	—	—	—	—	—
58	—	76.40	—	117.54?	83.67	—	—	—	—	—	—
59	79 49	—	45.45	110.53	90.80	—	—	—	52.22	49.21	—
60	—	97.33	44.21	111.97	77.89	—	—	—	—	52.91	—
61	81.40	85.19	51.38?	133.93	—	—	—	—	54.74	49.22	—
62	80.49	82 50	47.62	124.00	79.35	73 78?	67.11?	97.84	50 00	51.23	72.43
63	—	94.67	52 53	107.76	68.04	—	—	—	—	—	—
64	85.53	72.94	—	—	—	—	—	—	—	—	—
65	73.81	75 00	66.67	—	78.41?	—	—	—	—	—	—
66	88.89	—	41.18	108.70	78.12	72.77	74.55	—	—	—	—
67	—	91.57	52.87	—	—	—	—	85.82	42.96	59.88	78.26
68	—	—	—	—	—	—	—	—	—	—	—
CEMETERY H (JAR BURIAL)											
69	—	—	—	124.00	92.86	—	—	—	—	—	—
70	80.00	77.01	52 94	112.50	—	79.28	90.09	97.04	52.99	54.04	75.19
71	78.21	75.00	57.45	—	—	—	—	96.45	41.91	53.26	69.85
72	80.95	—	—	—	—	—	—	—	—	—	—
73	—	—	55.00?	—	—	—	—	—	—	—	70.63

M a x i l l a r y . t e e t h

[illegible]**CEMETERY H (OPEN BURIAL)**[illegible]

CEMETERY H (JAR BURIAL)

[illegible]

No.	M a n d i b u l a r t e e t h											
	M 81	M 81 (1)	M 81	M 81 (1)	M 81	M 81 (1)	M 81	M 81 (1)	M 81	M 81 (1)	M 81	M 81 (1)
	Mesiodistal crown diam. Right M 1	Labiolingual crown diam. Right M 1	Mesiodistal crown diam. Left M 1	Labiolingual crown diam. Left M 1	Mesiodistal crown diam. Right M 2	Labiolingual crown diam. Right M 2	Mesiodistal crown diam. Left M 2	Labiolingual crown diam. Left M 2	Mesiodistal crown diam. Right M 3	Labiolingual crown diam. Right M 3	Mesiodistal crown diam. Left M 3	Labiolingual crown diam. Left M 3

CEMETERY H (OPEN BURIAL)

56	—	—	—	—	—	—	—	—	10.0	8.5	—	—
57	—	—	—	—	—	—	—	—	—	—	—	—
58	10.5	9.5	11.0	10.5	10.5	10.0	11.0	9.5	—	—	10.5	9.5
59	—	—	—	—	—	—	—	—	—	—	—	—
60	10.5	9.5	10.5	10.0	9.5	9.0	10.0	9.0	10.0	8.5	10.0	9.0
61	—	—	—	—	—	—	—	—	—	—	—	—
62	11.0	10.5	11.0	10.5	9.5	9.0	9.0	9.0	10.0	9.5	11.0	8.5
63	10.5	10.5	10.0	10.0	9.5	10.5	10.0	9.5	10.0	10.0	10.0	9.5
64	—	—	—	—	—	—	—	—	—	—	—	—
65	—	—	—	—	10.0	10.0	—	—	—	—	—	—
66	10.0	10.0	10.5	10.5	10.0	9.0	9.0	10.0	—	—	9.0	8.5
67	—	—	—	—	—	—	—	—	—	—	—	—
68	—	—	—	—	—	—	—	—	—	—	—	—

CEMETERY H (JAR BURIAL)

69	11.5	11.0	12.5	11.5	10.5	11.0	11.0	11.5	10.5	11.0	9.5	10.5
70	—	—	—	—	—	—	—	—	—	—	—	—
71	10.5	11.5	—	—	11.5	10.5	—	—	—	—	—	—
72	—	—	—	—	—	—	—	—	—	—	—	—
73	—	—	—	—	11.0	12.0	—	—	9.0	11.0	—	—

No.	Crown index of maxillary teeth M 81 (1)/M 81						Crown index of mandibular teeth M 81 (1)/M 81					
	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3

CEMETERY H (OPEN BURIAL)

56	115.79	116.67	116.67	110.53	111.76	—	—	—	—	—	85.00	—
57	—	—	—	—	—	—	—	—	—	—	—	—
58	110.00	110.00	116.67	105.00	94.74	116.67	90.48	95.45	95.24	86.36	—	90.48
59	114.29	126.32	129.41	127.78	140.00	122.22	—	—	—	—	—	—
60	120.00	115.00	110.53	111.11	111.11	131.25	90.48	95.24	94.74	90.00	85.00	90.00
61	95.45	95.65	90.91	105.26	110.53	89.47	—	—	—	—	—	—
62	104.76	110.00	129.41	123.53	123.53	117.65	95.45	95.45	94.74	100.00	95.00	77.27
63	105.00	100.00	127.78	137.50	111.11	—	100.00	100.00	110.53	95.00	100.00	95.00
64	127.78	—	95.24	—	100.00	—	—	—	—	—	—	—
65	—	—	—	90.00	—	118.75	—	—	100.00	—	—	—
66	109.52	104.55	122.22	100.00	112.50	112.50	100.00	100.00	90.00	111.11	—	94.44
67	—	—	—	—	—	—	—	—	—	—	—	—
68	—	—	—	—	—	—	—	—	—	—	—	—

CEMETERY H (JAR BURIAL)

69	113.64	114.29	131.58	—	135.29	109.52	95.65	92.00	104.76	104.55	104.76	110.53
70	113.64	—	104.55	120.00	—	122.22	—	—	—	—	—	—
71	—	—	—	—	—	—	109.52	—	91.30	—	—	—
72	—	—	—	—	—	—	—	—	—	—	—	—
73	—	—	—	—	—	—	—	—	109.09	—	122.22	—

Angular measurements on cranlograms

No.	W 3	W 4	W 5	W 9	W 11	W 12	W 13	W 14	W 15	W 7
	Frontal inclination angle	Occipital inclination angle	Facial profile angle	Calvarial base angle	Frontal curvature angle	Parietal curvature angle	Occipital curvature angle	Occipital flexional angle	Superior facial length angle	Alveolar profile angle

CEMETERY H (OPEN BURIAL)

56	—	—	—	—	—	—	—	—	—	—
57	61°	81.5°	—	9°	128°	139°	114.5°	114.5°	—	—
58	—	—	—	—	—	—	—	—	—	—
59	—	—	—	—	—	—	—	—	—	—
60	—	—	—	—	—	—	—	—	—	—
61	—	—	—	—	—	—	—	—	—	—
62	60.5°	81.5°	89°	10.5°	136.5°	137°	120.5°	121°	40°	100°
63	—	—	—	—	—	—	—	—	—	—
64	—	—	—	—	—	—	—	—	—	—
65	62.5°	79°	82°	7°	130.5°	130°	104°	110°	32°	75.5°
66	—	—	—	—	—	—	—	—	—	—
67	—	—	—	—	—	—	—	—	—	—
68	—	—	—	—	—	—	—	—	—	—

CEMETERY H (JAR BURIAL)

69	—	—	—	—	—	—	—	—	—	—
70	61°	80.5°	85°	11°	132°	125°	113°	114°	38°	78°
71	60.5°	—	83°	8°	123.5°	—	—	—	33.5°	68°
72	—	—	—	—	—	—	—	—	—	—
73	—	—	—	—	—	—	—	—	—	—

No.	Skl No.	Sex	Age	M 1	M 8	M 2a	M 17	M 9	M 21	M 25	M 24b
				Maximum Cranial length	Maximum Cranial breadth	Nasion-Inion length	Basion-bregma height	Minimum frontal breadth	Vertical porion height	Median sagittal arc	Vertical transversal arc

CEMETERY H (JAR BURIAL)

74	H 154 (a)	F	A	176.0	128.0	166.5	139.0	85.0	—	362.0	—
75	H 206 (d)	F	A	173.0	133.0	165.0	125.0	93.0	—	344.0	—
76	H 245 (e)	F	A	175.0	147.0	—	—	—	—	—	—
77	H 246 (c)	F	A	182.0	135.0	167.0	135.0	96.0	111.0	371.0	298.0
78	H 247 (a)	F	A	176.0	—	—	130.0	—	108.5	—	282.0
79	H 247 (b)	F	A	178.0	133.0	—	125.5	87.5	108.0	353.0?	292.0
80	H 7435 (b)	F	A	178.0	129.0?	165.0	117.0	91.0	100.0	350.0	283.0
81	Pot no. 11	F	A	173.0	131.0	166.0	122.0	92.0	103.0	352.0	284.5
82	Pot no. 12 (a)	F	A	173.0	131.0	162.0	119.0	90.0	107.5	360.0	289.0
83	Pot no. 12 (b)	F	A	—	119.0	—	124.0	—	—	—	285.0
84	H 206 (a)	F	Juv.	—	—	—	—	—	—	—	—
85	H 245 (a)	F	Juv.	167.0	128.0	160.0	124.0	83.0	105.0	335.0	284.0
86	H 231 (c)		Infant	—	—	—	—	—	—	—	—

	M 23	M 40	M 48	M 47	M 45	M 55	M 54	M 50	M 51	M 51	M 52	M 52
No.	Horizontal circumference	Prosthion-basion line	Nasion-prosthion line	Nasion-gnathion line	Bizygomatic breadth	Nasal height	Nasal breadth	Ant. interorbital breadth	Orbital breadth (right)	Orbital breadth (left)	Orbital height (right)	Orbital height (left)

CEMETERY H (JAR BURIAL)

74	493.0	—	—	—	—	54.0	—	16.5	35.0	37.0	—	—
75	491.0	91.0	54.0	96.0?	—	43.0	28.0	18.5	—	41.5	35.0	31.5
76	—	—	—	—	—	—	25.5	—	—	—	—	—
77	573.0	—	—	—	—	—	—	20.0	39.0	39.0	33.0	—
78	488.0	100.0	63.5	—	119.0	48.0	26.0	21.0	41.5	—	33.0	—
79	504.0	96.5	60.0	—	—	46.0	26.0	17.5	39.0	40.0	32.5	32.0
80	499.0	100.5?	57.0	—	—	44.0?	23.5	18.5	39.0?	41.5	—	30.0
81	494.0	89.5	65.0	—	125.0	49.5	24.0	22.0	40.0	39.5	30.0	34.0
82	488.0	85.0	56.5	—	116.0	45.0	24.0	18.5	39.0	34.0	31.5	30.0
83	—	—	—	—	—	—	—	—	—	—	—	—
84	—	—	—	—	—	—	—	—	—	—	—	—
85	478.0	90.0	60.5	—	117.0	48.5	25.0	16.0	39.0	39.0	34.0	—
86	—	—	36.5	—	—	28.0	19.0	15.0	32.0	31.0	28.5	26.0

No.	M 60 Maxillo-alveolar length	M 61 Maxillo-alveolar breadth	M 62 Palatal length	M 63 Palatal breadth	M 66 Bigonial breadth	M 65 Bicondylar breadth	M 70 Ht. of mandibular ramus	M 71 (1) Max. breadth of mandibular ramus	M 71 Min. breadth of mandibular ramus	M 69 Ht. at mandibular symphysis	M 68 Mandibular length	M 79 Mandibular angle
CEMETERY H (JAR BURIAL)												
74	—	—	—	—	—	—	57.0	41.5	34.0	—	88.0	123°
75	—	—	—	—	—	—	50.5	39.0	30.0	21.0	81.0	123°
76	—	—	—	—	—	—	—	—	—	25.0	—	—
77	—	—	—	—	—	—	—	—	—	—	—	—
78	60.0?	63.5?	42.0	—	—	—	—	—	—	—	—	—
79	—	—	39.0	—	—	—	—	—	—	—	—	—
80	57.0	64.0	—	—	—	—	—	—	34.0	—	—	—
81	56.0	64.5	—	—	—	—	—	—	—	—	—	—
82	49.0	64.0	41.0?	35.0?	—	—	—	—	—	—	—	—
83	—	—	—	—	—	—	—	—	—	—	—	—
84	—	—	—	—	75.5	103.0	41.0	39.0	31.0	—	72.0	123°
85	46.5	62.5	37.0	35.0	84.5	—	—	35.0	31.0	26.0	74.0	121°
86	—	—	—	—	53.5	80.5	24.5	24.0	21.0	19.5	46.5	133°

[illegible]

CEMETERY H (JAR BURIAL)

[illegible]

No.	M 52/M 51	M 52/M 51	M 54/M 55	M 61/M 60	M 63/M 62	M 68/M 65	M 66/M 65	M 45/M 8	M 48/M 17	M 40/M 1	M 9/M 45
	Orbital index (right)	Orbital index (left)	Nasal index	Maxillo-alveolar index	Palatal index	Mandibular index	Breadth index of mandible	Trans. craniofacial index	Vert. craniofacial index	Longitudinal craniofacial index	Jugo-frontal index

CEMETERY H (JAR BURIAL)

74	—	—	—	—	—	—	—	—	—	—	—
75	—	75.90	65.12	—	—	—	—	—	43.20	52.60	—
76	—	—	—	—	—	—	—	—	—	—	—
77	84.62	—	—	—	—	—	—	—	—	—	—
78	79.52	—	54.17	105.83?	—	—	—	—	48.85	56.82	—
79	83.33	80.00	56.52	—	—	—	—	—	47.81	54.21	—
80	—	72.29	53.41?	112.28	—	—	—	—	48.72?	56.46?	—
81	75.00	86.08	48.48	115.18	—	—	—	95.42	53.28	51.73	73.60
82	80.77	88.24	53.33	130.61	85.37?	—	—	88.55	47.48	49.13	77.59
83	—	—	—	—	—	—	—	—	—	—	—
84	—	—	—	—	—	69.90	73.30	—	—	—	—
85	87.18	—	51.55	134.41	—	—	—	91.41	48.79	53.89	70.94
86	89.06	83.87	67.86	—	—	57.76	66.46	—	—	—	—

M a x i l l a r y t e e t h

[illegible]

M a n d i b u l a r t e e t h

[illegible]

CEMETERY H (JAR BURIAL)

[illegible]

No.	Crown Index of maxillary teeth M 81 (1)/M 81						Crown Index of mandibular teeth M 81 (1)/M 81					
	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3

CEMETERY H (JAR BURIAL)

74	109.09	—	115.79	—	—	—	95.24	86.36	94.44	85.00	94.74	—
75	—	—	—	—	—	—	—	110.00	—	105.56	—	100.00
76	—	—	—	—	—	—	—	—	—	—	—	—
77	—	—	—	—	—	—	—	—	—	—	—	—
78	—	—	—	—	—	—	—	—	—	—	—	—
79	—	—	—	—	—	—	—	—	—	—	—	—
80	—	—	—	—	—	—	—	—	—	—	—	—
81	100.00	109.52	—	110.00	—	111.11	—	—	—	—	—	—
82	—	—	—	—	—	—	—	—	—	—	—	—
83	—	—	—	—	—	—	—	—	—	—	—	—
84	—	—	—	—	—	—	—	—	—	—	—	—
85	115.00	104.76	114.29	115.00	—	—	—	—	—	—	—	—
86	—	—	—	—	—	—	—	—	—	—	—	—

Angular measurements on cranlograms

No.	W 3	W 4	W 5	W 9	W 11	W 12	W 13	W 14	W 15	W 7
	Frontal inclination angle									
		Occipital inclination angle								
			Facial profile angle							
				Calvarial base angle						
					Frontal curvature angle					
						Parietal curvature angle				
							Occipital curvature angle			
								Occipital flexional angle		
									Superior facial length angle	
										Alveolar profile angle

CEMETERY H (JAR BURIAL)

[illegible]

[illegible][illegible]

7	10.0	9.0	10.5	—	10.0	—	10.0	9.5	9.5	9.0	9.5	9.0
---	------	-----	------	---	------	---	------	-----	-----	-----	-----	-----

8	—	—	—	—	—	—	—	—	—	—	—
9	11.0	9.0	11.0	8.5	10.0	7.0	10.0	8.0	—	—	—

10

No.	Crown index of mandibular teeth M 81 (1)/M 81					
	Right M 1	Left M 1	Right M 2	Left M 2	Right M 3	Left M 3

CEMETERY R 37

1	—	—	—	—	—	—
2	90.91	95.45	100.00	100.00	90.48	94.74
3	—	—	85.71	—	90.00	—
4	—	—	—	—	—	—
5	90.91	90.91	90.00	80.00	—	—
6	—	—	—	—	—	—

AREA G

7	90.00	—	—	95.00	94.74	94.74
---	-------	---	---	-------	-------	-------

CEMETERY H (OPEN BURIAL)

8	—	—	—	—	—	—
9	81.82	77.27	70.00	80.00	—	—

CEMETERY H (JAR BURIAL)

10	—	—	—	—	—	—
----	---	---	---	---	---	---

No.	Skl No.	Sex	Age	Cranial contour in norma verticalis							Vertical aspect of the arcus zygomaticus		
				Ellipsoides	Pentagonoides	Rhomboides	Ovoides	Sphenoides	Sphaeroides	Byrsoides	Phaenogygy	Orthogygy	Cryptozygy

CEMETERY R 37

1	H 779 (e)	M	A	+							+		
2	H 793	M	A					+			+		
3	H 793 (A)	M	A				+				+		
4	H 793 (B)	M	A				+						
5	H 794	M	A					+			+		
6	H 796 (B)	M	A					+			+		
7	H 798 (A)	M	A					+			+		
8	H 798 (B)	M	A				+						
9	H 798 (C)	M	A					+					
10	H 806	M	A	+							+		
11	H 811	M	A	+									
12	H 818	M	A	+							+		
13	H 820 (iii)	M	A					+			+		
14	Skl. 1	M	A							+	+		
15	Skl. 10	M	A					+				+	
16	H 801 (B)	M	Juv.										
17	H 779 (a)	F	A	+							+		
18	H 779 (c)	F	A	+							+		
19	H 779 (d)	F	A										
20	H 780	F	A		+							+	
21	H 788	F	A										
22	H 791/A	F	A				+				+		

No.	Supraorbital ridges	Forehead slope	Nasal profile	Shape of nasal bones
	Absent			
	Slight			
	Medium			
	Prominent			
		Vertical		
		Slightly receding		
		Receding		
			Straight	
			Concave	
			Convex	
			Concavo-convex	
				Narrow constricted
				Broad constricted
				Wing shaped

CEMETERY R 37

1			+		+		+				+
2			+		+						
3				+			+				+
4	+				+			+			+
5			+			+		+			+
6			+			+					+
7			+			+		+			+
8			+				+				
9			+		+						
10			+			+		+		+	
11		+									
12		+			+			+			+
13			+			+		+		+	
14			+			+		+			+
15						+		+			+
16								+		+	
17		+			+						
18	+			+							
19	+			+				+		+	
20		+			+			+			
21	+										
22		+		+							

No.	Nasal root depression				Margo piriformis inferior				Subnasal prognathism			
	Absent	Shallow	Medium	Depressed	Amblykraspedotic	Bothrokraspedotic	Oxykraspedotic	Orygmokraspedotic	Absent	Slight	Medium	Marked

CEMETERY R 37

1			+		+						+	
2				+								+
3			+				+				+	
4	+				+					+		
5				+			+					+
6			+				+					+
7				+	+							+
8				+								
9												
10			+				+					+
11												
12	+						+					+
13				+			+				+	
14				+	+							+
15				+			+					+
16							+		+			
17		+					+					+
18		+					+		+			
19	+											
20			+				+				+	
21		+					+				+	
22	+											

H

No.	Occipital protuberance				Occipital contour		Dental arch			Shape of foramen magnum			
	Round	Moderately protruding	Markedly protruding	Flat	Wedge shaped	House shaped	Upsiloid	Ellipsoid	Paraboloid	Elliptic	Oval (base posterior)	Oval (base anterior)	Round

CEMETERY R 37

1			+		+		+						
2		+				+			+		+		
3	+					+	+			+			
4	+					+			+		+		
5	+					+			+			+	
6		+				+			+		+		
7		+				+	+			+			
8													
9		+				+							
10			+			+			+				+
11			+			+			+				
12													
13			+			+			+			+	
14		+				+	+						+
15		+				+	+				+		
16									+		+		
17		+				+			+	+			
18		+				+			+				+
19													
20		+			+		+				+		
21							+			+			
22		+				+							

No.	Skl No.	Sex	Age	Cranial contour in norma verticalis							Vertical aspect of the arcus zygomaticus		
				Ellipsoides	Pentagonoides	Rhomboides	Ovoides	Sphenoides	Sphaeroides	Byrsoides	Phaenozogy	Orthozogy	Cryptozogy

CEMETERY R 37

23	H 795/A	F	A		+			+
24	H 798/A I	F	A				+	+
25	H 798 (a)	F	A		+			+
26	H 801/A	F	A	+				+
27	H 804	F	A					
28	H 805	F	A	+				+
29	H 806/A	F	A		+			+
30	H 812	F	A	+				+
31	H 816	F	A	+			+	
32	H 817	F	A			+		+
33	H 820 (I)	F	A		+			+
34	H 820 (II)	F	A			+		
35	Skl. 2	F	A			+		+
36	H 798/A 2	F	Juv.		+			+

AREA G

37	I S 11	M	A	+	+
38	II S 18	M	A	+	+
39	II S 42	M	A	+	+
40	III S 2	M	A	+	+

No.	Supraorbital ridges				Forehead slope			Nasal profile				Shape of nasal bones		
	Absent	Slight	Medium	Prominent	Vertical	Slightly receding	Receding	Straight	Concave	Convex	Concavo-convex	Narrow constricted	Broad constricted	Wing shaped

CEMETERY R 37

23		+					+							
24		+			+				+					+
25				+		+			+				+	
26	+				+				+			+		
27	+				+									
28	+				+				+					+
29			+			+		+						+
30			+			+			+					
31			+			+				+				+
32	+					+		+				+		
33		+			+									
34		+				+			+				+	
35		+				+			+					+
36		+				+		+					+	

AREA G

37			+			+		+						
38		+			+			+					+	
39			+		+			+						+
40		+			+				+			+		

No.	Nasal root depression				Margo piriformis inferior				Subnasal prognathism			
	Absent	Shallow	Medium	Depressed	Amblykraspedotic	Bothrokraspedotic	Oxykraspedotic	Orygmokraspedotic	Absent	Slight	Medium	Marked

CEMETERY R 37

23		+					+					+
24		+					+		+			
25			+				+				+	
26	+						+		+			
27	+						+		+			
28	+						+		+			
29			+					+				+
30			+									
31			+				+				+	
32	+						+			+		
33	+						+		+			
34			+		+							+
35			+				+					+
36	+						+		+			

AREA G

37		+			+							
38		+					+			+		
39		+					+					
40	+						+					

No.	Occipital protuberance				Occipital contour		Dental arch			Shape of foramen magnum				
	Round	Moderately protruding	Markedly protruding	Flat	Wedge shaped	House shaped	Upsiloid	Ellipsoid	Paraboloid	Elliptic	Oval (base posterior)	Oval (base anterior)	Round	Rhomboid

CEMETERY R 37

23	+					+			+					
24	+					+	+							
25	+					+	+							+
26		+			+						+			
27														
28		+				+				+				
29		+			+				+					
30		+				+	+				+			
31	+					+	+							
32						+			+					
33		+				+	+						+	
34	+								+					
35	+					+			+					
36		+				+			+	+				

AREA G

37		+				+			+	+				
38	+					+			+		+			
39		+				+			+		+			
40	+					+			+					

No.	Supraorbital ridges				Forehead slope			Nasal profile				Shape of nasal bones		
	Absent	Slight	Medium	Prominent	Vertical	Slightly receding	Receding	Straight	Concave	Convex	Concavo-convex	Narrow constricted	Broad constricted	Wing shaped

AREA G

41				+		+			+			+		
42			+			+					+			+
43		+			+				+			+		
44		+			+									
45		+			+			+				+		
46		+				+			+			+		

MOUND AB

52				+			+				+			+
54	+					+		+					+	

CEMETERY H (OPEN BURIAL)

56									+				+	
57			+			+		+						
58														
59		+				+		+				+		
60									+					

No.	Nasal root depression				Margo piriformis inferior				Subnasal prognathism			
	Absent	Shallow	Medium	Depressed	Amblykraspedotic	Bothrokraspedotic	Oxykraspedotic	Orygmokraspedotic	Absent	Slight	Medium	Marked

AREA G

41		+					+			+		
42		+			+					+		
43	+						+				+	
44							+					
45	+						+			+		
46		+					+				+	

MOUND AB

52			+				+		+			
54	+						+		+			

CEMETERY H (OPEN BURIAL)

56		+					+					
57		+							+			
58										+		
59		+					+		+			
60			+				+		+			

No.	Supraorbital ridges				Forehead slope			Nasal profile				Shape of nasal bones		
	Absent	Slight	Medium	Prominent	Vertical	Slightly receding	Receding	Straight	Concave	Convex	Concavo-convex	Narrow constricted	Broad constricted	Wing shaped

CEMETERY H (OPEN BURIAL)

61			+			+								
62				+			+							
63	+				+			+						+
64		+			+				+					+
65			+			+		+						+
66	+				+									
67								+						+
68	+				+									

CEMETERY H (JAR BURIAL)

69														
70				+			+		+			+		
71				+			+		+			+		
72														
73	+				+				+					
74	+				+									
75	+					+			+					+
76						+								
77		+			+				+					+
78						+								

No.	Nasal root depression				Margo piriformis inferior				Subnasal prognathism			
	Absent				Amblykraspedotic				Absent			
	Shallow				Bothrokraspedotic				Slight			
	Medium				Oxykraspedotic				Medium			
	Depressed				Orygmokraspedotic				Marked			

CEMETERY H (OPEN BURIAL)

[illegible]

CEMETERY H (JAR BURIAL)

[illegible]

No.	T i b l e							F i b u l a		
	M 1a	M 2	M 8	M 9	M 10b	M 9/M 8	M 10b/M 1a	M 1	M 4a	M 4a/M 1
	Maximum length (Spino-malleolar)	Physiological length	Sagittal diameter at the middle	Transversal diameter at the middle	Minimum circumference of diaphysis	Index of cross-section in the middle	Robusticity index	Maximum length	Minimum circumference	Robusticity index

CEMETERY H (OPEN BURIAL)

[illegible]

COLLECTIVE TABLE: Extremity House H

1000

[illegible]

CEMETERY H (OPEN BURIAL)

44	H 501 (a)	[Rt]	F	A	2000	45.5	—	45.5	70.5	70.5	19/19
45	H 501 (a)	[L]	F	A	2000	—	—	41.5	55.5	55.5	19/19
46	H 639	[L]	F	A	—	—	71.5	71.5	71.5	71.5	19/19
47	H 710	[R]	F	A	2550	44.5	71.5	44.5	71.5	71.5	19/19
48	H 710	[L]	F	A	2550	44.5	71.5	44.5	71.5	71.5	19/19

~~CEMETERY~~ ~~IN~~ ~~THE~~ ~~AREA~~

[illegible]

No.	PEARSON'S 'REGRESSION FORMULAE'					DUPERTUIS & HADDEN'S 'GENERAL FORMULAE'				
	Femur (a)	Humerus (b)	Tibia (c)	Radius (d)	Average	Femur (a)	Tibia (b)	Humerus (c)	Radius (d)	Average

CEMETERY H (OPEN BURIAL)

23	—	1535.4	1566.2	—	1550.8	—	1607.2	1586.7	—	1597.0
24	1465.6	—	1495.7	1551.0	1504.1	1492.3	1531.2	—	1591.6	1538.4
25	—	1535.4	—	—	1535.4	—	—	1586.7	—	1586.7
26	—	1477.6	1509.8	—	1493.7	—	1546.4	1520.7	—	1533.6

CEMETERY H (JAR BURIAL)

27	—	—	—	—	—	—	—	—	—	—
28	—	—	1592.1	—	1592.1	—	1635.1	—	—	1635.1
29	—	1593.3	—	—	1593.3	—	—	1652.7	—	1652.7
30	—	1483.1	—	—	1483.1	—	—	1526.9	—	1526.9